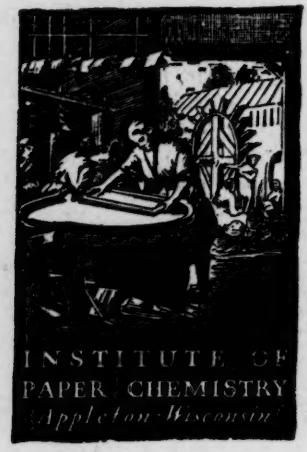
Pages 949-1042

BULLETIN

OF

THE INSTITUTE OF PAPER CHEMISTRY



AFFILIATED WITH

LAWRENCE COLLEGE

APPLETON, WISCONSIN

LIBRARY NOTES

AUGUST · 1954
Volume 24 Number 12

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THE INSTITUTE OF PAPER CHEMISTRY

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Periodicals, Books, and Pamphlets Added to the Library During July

PERIODICALS—BACK VOLUMES

Evolution, v. 1-date, 1947-date.
Transactions of the American Society of Mechanical Engineers, v. 72-date, 1950-date.
Zeitschrift für Forstgenetik und Forstpflanzenzüchtung, v. 1-date, 1952-date.

BOOKS AND PAMPHLETS

CHEMISTRY—YEARBOOKS

CHEMICAL SOCIETY, *London*. Annual reports on the progress of chemistry for 1953. London, The Society, 1954. v. 50. 430 p.

SOCIETY OF CHEMICAL INDUSTRY. Reports on the progress of applied chemistry : 1953. London, The Society [1954] v. 38. 989 p.

CHEMISTRY, ORGANIC

BEILSTEIN, FRIEDRICH KONRAD. Beilsteins Handbuch der organischen Chemie. 4. Auflage. Zweites Ergänzungswerk, die Literatur von 1920-29 umfassend, herausgegeben und bearbeitet von Friedrich Richter. Berlin, etc., Springer-Verlag, 1954. 24. Band. 419 p.

CHROMATOGRAPHY

CRAMER, FRIEDRICH. Paper chromatography. 2d rev. and enl. ed., translated by Leighton Richards. London, Macmillan; New York, St. Martin's Press, 1954. 124 p. + 2 fold. plates.

CONTAINERS

WERNER, A. W. The manufacture of fibre boxes. 3d rev. ed. Ed. by Harry J. Bettendorf. Chicago, Board Products Publ. Co., c1954. 168 p.

FERMENTATION

ENEBO, LENNART. Studies in cellulose decomposition by an anaerobic thermophilic bacterium and two associated non-cellulolytic species. Stockholm [Viktor Pettersons Bokindustri Aktiebolag] 1954. 125 p. + 5 plates.

FLUORESCENCE

DE MENT, JACK. Fluorochemistry; a comprehensive study embracing the theory and applications of luminescence and radiation in physicochemical science. Brooklyn, Chem. Publ. Co., 1945. 796 p.

PRINGSHEIM, PETER. Fluorescence and phosphorescence. New York, Interscience Publishers, 1949. 794 p.

RADLEY, J. A., and GRANT, JULIUS. Fluorescence analysis in ultra-violet light. 4th ed. rev., under the editorship of H. Howard Tripp. London, Chapman & Hall, 1954. 560 p.

FOREST PRODUCTS—TERMINOLOGY

BROWN, NELSON C., ed. Wood industries dictionary; a ready-reference guide to terminology used throughout the forest products field. Chicago [Vance Publ. Corp., 1953] 42 p.

FRENCH LANGUAGE

PATTERSON, AUSTIN M. A French-English dictionary for chemists. 2d ed. New York, Wiley [c1954] 476 p.

GERMAN LANGUAGE

KING, ALEXANDER, and FROMHERZ, HANS. German-English chemical terminology; an introduction to chemistry in English and German. 2d and rev. ed. London, Thomas Murby, 1951. 361 p.

PAPER MAKING AND TRADE

BJÖÖRN, ERLAND O. Woodpulp; a technical and commercial handbook. Translated from the original Swedish text by J. P. Firrell and I. R. de Maré. Stockholm, AB Svensk Trävaru-Tidning [c1954] 360 p.

PAPER MAKING AND TRADE—TABLES, CALCULATIONS, ETC.

The LIGHTNING CALCULATOR of sizes, weights, prices etc. for paper-manufacturers, stationers, and export merchants. 5th ed. Oslo, Joh. H. Aanensen, 1946. 50 p.

PARTICLE SIZE

ROSE, H. E. The measurement of particle size in very fine powders. New York, Chem. Publ. Co., 1954. 127 p.

PERIODICALS—BIBLIOGRAPHY

WORLD LIST of scientific periodicals published in the years 1900-1950. 3d ed., ed. by William Allan Smith and Francis Lawrence Kent, assisted by George Burder Stratton. London, Butterworths Scientific Publications, 1952. 1058 p.

PHYSICS

CONSTANT, F. WOODBRIDGE. Theoretical physics; mechanics of particles, rigid and elastic bodies, fluids, and heat flow. Cambridge, Mass., Addison-Wesley, 1954. 281 p.

PHYSIOLOGY

MILLER, EDWIN C. Plant physiology with reference to the green plant. 2d ed. New York, McGraw-Hill Book Co., 1938. 1201 p.

SURFACE CHEMISTRY

ALEXANDER, A. E. Surface chemistry; an introduction to its principles and applications. New York, Longmans, Green [1951] 70 p.

TEXTILE INDUSTRY AND FABRICS

MATTHEWS, J. MERRITT. Matthews' textile fibers, their physical, microscopic, and chemical properties. 6th ed. prepared by a staff of specialists under the editorship of Herbert R. Mauersberger. New York, Wiley [c1954] 1283 p.

UNIVERSITIES AND COLLEGES—PUBLICATIONS

AMERICAN CHEMICAL SOCIETY. *Committee on Professional Training.* Faculties, publications, and doctoral theses in chemistry and chemical engineering at United States universities. Washington, The Society, 1953. 245 p.

WATER—POLLUTION

GREAT BRITAIN. *Department of Scientific and Industrial Research. Water Pollution Research Board.* Report of the Water Pollution Research Board, with the report of the director of Water Pollution Research for the year 1953. London, H. M. Stationery Off., 1954. 62 p.

WET STRENGTH

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. [*Wet Strength Committee*] Wet strength in paper and paperboard. Authors: Britt, K. W., Donahue, J. E., Goodale, R. P., Gruntfest, I. J., Kelley, L. E., Maxwell, C. S. [and] Weidner, J. P. TAPPI monograph series no. 13. New York, The Association, 1954. 96 p.

Survey of Periodical Articles

The following are abstracts of opinions expressed by writers in the technical journals. The Institute of Paper Chemistry takes no responsibility for the opinions here summarized.

ABILITY TESTS

RYTI, NIILO. Psychological adaptability tests in the selection of paper-machine operators. Paper and Timber (Finland) 36, no. 6: 275-8 (June, 1954). [In Finnish; English summary]

In the Kangas paper mill of G. A. Serlachius Oy in Finland, a test with 36 men working on paper machines was organized to determine whether psychological adaptability tests can be utilized in the selection of paper-machine operators. A careful success control based on the foremen's and engineers' reports gave the correlation coefficient +0.62 compared with the test result, a figure which must be considered very satisfactory. An extract of the job analysis of the paper-machine operator's task is given, including reports on the performance of the test and the success control. In conclusion, an estimate is made of the practical benefits of the use of such tests. E.S.

ACID RESISTANT MATERIAL

HÖLSÖ, V.-J. Acid-resistant building materials. Paper and Timber (Finland) 36, no. 6: 282-6 (June, 1954). [In Finnish; English summary]

The author discusses briefly the properties and possible applications of the most common acid-resistant materials of construction in sulfite mills, particularly bricks and cements used in masonry. 1 diagram. E.S.

SALLINEN, K. A. K. Acid-resistant linings in a sulfite mill. Paper and Timber (Finland) 36, no. 5: 247-54 (May, 1954); Finnish Paper and Timber 5, no. 4: 53-5 (1954). [In Finnish and English; first reference with English abstract, second reference abridgment]

Digesters and acid tanks are the most important objects in sulfite mills from the masonry-lining angle. During the last 10 years a change-over to carbon-brick lining has been made in Finland, not because carbon bricks afford better protection against acid, but because they resist temperature variations better. The Finnish lining method employs 40-mm. thick ceramic bricks as backing, laid against the steel shell with a litharge-silicate mortar, and carbon bricks of the same thickness laid with a silicofluoride (self-binding) cement for the inner course; the lining is thus 100 mm. thick. The occurrence of galvanic currents between the steel shell and the carbon bricks resulting in the shell's corrosion has been reported from some Swedish mills which employ thinner ceramic brick layers and self-binding mortar for both courses; this phenomenon has not been observed in Finland. The lining is estimated to last for about 25-30 years. Carbon bricks have also been used for lining sulfur dioxide-washing towers in mills where the temperature of the entering gas does not exceed 300°C. Acid towers (either wood or concrete, the latter predominating) are next in importance with regard to acid-resistant protection. They are lined with ceramic bricks about 70 mm. in thickness, laid in

self-binding, acid-resistant cement, employing the spiral masonry method. The purpose of this lining is twofold: protection against corrosive attack by the acid and protection against mechanical wear by the tumbling limestones. To reduce the latter, the upper part of the tower is also protected with wooden bricks. The acid chamber of the tower is first insulated with an acid-resistant bituminous layer, about 8 mm. in thickness, and then lined with a double ceramic wall, 20 and 50 mm. thick, respectively, laid with self-binding mortar for both courses. Only quite recently in Finland, attention has been paid to the acid protection of floors, channels, foundations, etc. Four different floor constructions are described, which depend on the chemical reactions which they have to resist. 13 figures and 8 references in the first and 5 figures in the second reference. E.S.

ADHESIVES

McLAREN, A. D. Adhesion of polymers to cellulose. Modern Plastics 31, no. 11: 114, 116, 181 (July, 1954).

A general theory of the adhesion of high polymers to cellulose is presented. The theory includes a consideration of the influence of the following factors: melt viscosity and tack temperature of polymers, kinds and numbers of polar groups in polymers, plasticization, temperature, and nature of the surface. With cellophane-polymer systems polarity and hydrogen bonding are of paramount importance in adhesion. 1 table, 3 diagrams, and 7 references. E.S.

SCHULLER, SAM, and BROWN, W. C. Vinyl base adhesive developed for envelope industry. Paper, Film and Foil Converter 28, no. 7: 34 (July, 1954).

A new adhesive has been developed from a vinyl resin base, which is non-blocking, nontoxic, and practically tasteless. Tests have shown the adhesive to be unaffected, not even slightly tacky, under conditions of 100% R.H. and full-box pressure for 24 hours. Other advantages of the adhesive for envelope production are listed. R.A.S.

AERONAUTICS IN FORESTRY

ROTHERHAM, G. A. The use of helicopters in woods operations. Pulp Paper Mag. Can. 55, no. 7: 147, 149, 153, 155 (June, 1954).

The numerous ways in which the helicopter has been put to use in woods operations are outlined, including forest-fire fighting, timber cruising, freight work, road locating, rescue work, spraying, tree sampling, photography, wire-laying, and exploration. R.A.S.

ALCOHOLISM

ARCHIBALD, H. D. Those lost man hours and the great depressant. Can. Pulp Paper Ind. 7, no. 7: 28, 52 (July, 1954).

A survey on alcoholism in Canadian industry disclosed that the average rate of absenteeism on days following weekends or other days of rest was 18.7 days/alcoholic for a 12-month period, resulting in a total loss of 2,805,000 work-days in one year. Other statistics on the problem are given and a program of training and education to solve the situation is advocated. 1 table. R.A.S.

ALKALINE PROCESSES—ODOR TROUBLE

VON BERGEN, JOHN M. Odor counteraction in kraft mill operation. Paper Mill News 77, no. 27: 120, 122, 124, 158 (July 3, 1954); repeated in no. 29: 12-14, 16 (July 17, 1954); Southern Pulp Paper Mfr. 17, no. 8: 60, 62-4, 66 (August, 1954).

The author discusses the possible serious consequences of lack of attention to the public-relations aspect of air pollution, the counteraction of odors with particular reference to kraft mill odors, and counteraction equipment and applications. 1 table. E.S.

ALUMINUM

HARRINGTON, W. A. Foil containers for processing pre-packaged foods. Brit. Packer 16, no. 6: 420-2 (June, 1954).

Press-formed aluminum-foil containers are expected to gain rapid popularity as a packaging means for the food industry in Great Britain, since restrictions on the metal have been lifted. Round, oblong, and square pans with curved, hemmed, and flange edges are described, as well as some closing machines. Uses for the foil container are listed. 11 figures. R.A.S.

BACTERIOLOGY

ROEMER, GERD B. Micro-organisms in worn-out library books and upon paper currency. Das Papier 8, no. 13/14: 279-80 (July, 1954). [In German]

The author investigated, for the presence of bacteria, the covers and several insides leaves, particularly the corners and edges, of old library books which had been in circulation at least 20 years; the oldest books had been purchased 25 years ago and loaned for up to 175 times. The number of germs was found to be surprisingly low and, with one exception, varied between two and 34 germs/sq. cm. of paper. On the average, 10 germs/sq. cm. were detected on the covers and five germs on the inside pages. A direct relationship between percentage of germs and age and degree of wear and soiling of the book could not be established. The highest number of germs was usually found in books which had been used recently. Among the bacteria whose presence was established were apathogenic spore-forming organisms (sarcinae and white staphylococci) known for their resistance to drying out and other influences. In isolated cases yellow staphylococci, coli bacteria, streptococci turning green (ordinary mouth bacteria), and fungi were also detected. Pathogenic germs which might be the cause of serious infectious diseases were not determined, although the present investigation did not cover tubercle bacilli. Similar work with 20 paper-currency bills showed the presence of much higher numbers of germs than were found on books. The lowest number on a comparatively new bill with smooth surface offering slight possibilities for adhesion still amounted to 30 germs/sq. cm. The same organisms as mentioned above were detected, in one case diphtheroid bacteria. Newsprint and magazine paper samples artificially infected with bacteria suspensions and dried for 24 hours at 37°C. were stored in the dark and exposed to daylight and partial sunlight (through closed windows) and tested daily for the rate of dying of the dried germs. From the samples stored in the dark, cultures could still be propagated after four weeks, whereas from those stored in daylight and partial sunlight, no more cultures could be propagated after four days. The results indicate that the danger of infection through dirty paper currency is far greater than that from old library books. 1 reference. E.S.

BAGASSE

AMOSS, W. J. Bagasse as a chemurgic source of industrial material. Chemurgic Dig. 13, no. 6: 9, 18-19 (June, 1954).

A partial list of the numerous uses which have been found for bagasse, a source of cellulose annually available in large quantities, is presented. The world production is estimated at 20 million tons/year. The history of bagasse paper dates back over 100 years; recently nitrating and dissolving pulps have been successfully produced. Bagasse is considered an important source of furfural, furfuraldehyde, formaldehyde, and various ketones.
R.A.S.

BARKERS AND BARKING—CHEMICAL

WILCOX, HUGH. Some results from the chemical treatment of trees to facilitate bark removal. J. Forestry 52, no. 7: 522-5 (July, 1954); *cf.* B.I.P.C. 24: 696.

Some of the results of experiments carried out at the State University of New York, College of Forestry on chemical debarking of living trees are reported. The response of different species to different chemicals; effect of varying concentrations and formulations of arsenic, types of girdles, and time of treatment; distribution of arsenic after treatment; arsenic content of pulp; anatomical features of peeling; and effect on wildlife are discussed. 2 references. R.A.S.

WILCOX, HUGH, CZABATOR, FELIX, and GIROLAMI, GUIDO. Seasonal variations in bark-peeling characteristics of some Adirondack pulpwood species. J. Forestry 52, no. 5: 338-42 (May, 1954); *cf.* B.I.P.C. 24: 89.

Results of experiments on the chemical debarking of trees which were carried out at the State University of New York, College of Forestry are reported. A tool for measuring bark-peeling resistances is described which was devised for testing the peeling of trees during the natural peeling season and for evaluating the effectiveness of chemical treatments to induce bark separation. These two factors were determined for red spruce, yellow birch, white birch, big-tooth aspen, white ash, beech, red maple, and sugar maple. 1 table, 12 figures, and 6 references. R.A.S.

WORT, D. J. Chemical barking of western hemlock and Douglas fir. Parts 1 and 2. Can. Pulp Paper Ind. 7, no. 6: 10-12, 14-16, 18, 20, 22-4, 26; no. 7: 8-10, 12-14, 16-18 (June, July, 1954); Paper Ind. 36, no. 5: 488-9 (August, 1954). [Abridgment]

This is a comprehensive illustrated report on a project carried out for the Western Division of the Canadian Pulp and Paper Association, on western hemlock and Douglas-fir. Band girdling (I) and frill girdling (II) were used and, although a variety of chemicals were applied in poisoning the trees, the most exhaustive experiments were made with 75% ammonium sulfamate (III), 60% sodium arsenite (IV), and Esteron 245 (the propylene glycol butyl ether ester of 2,4,5-trichlorophenoxyacetic acid) (V). The author also considered the subsequent insect and fungal attack; the climatic, edaphic, and biotic factors; the effects of chemicals other than (III), (IV), and (V); and the effects of treatments on wood density, etc. Hemlocks responded well to treatment with (III) or (IV) with respect to ease of bark removal and reduction in wood weight. Douglas-fir, while also respond-

ing favorably, reacted less uniformly and much more slowly than did the hemlocks. Whereas a number of the 53 chemicals used caused the death of the trees, only (III) (and related arsenites) and (IV) caused loosening of the bark in Douglas-fir. Hemlocks responded to certain other sulfamates as well and to a few other chemicals. From a practical standpoint, (II) proved less expensive and more satisfactory than did (I), although the rate of killing was at times more rapid with (I) than with (II). In hemlocks, the minimum killing time was 29 days and the earliest easy barking was after two months; when (IV) was applied in July, (III) killed hemlocks in a minimum of 50 days. Douglas-firs were killed in a minimum of 55 days with (III) and 75 days with (IV) and could not be readily peeled until 15 months after treatment (applied in May-June). Compared with untreated trees, felled at the time of testing, the wood density of hemlock was reduced by about 17% and that of Douglas-fir by about 20%. The only insects present after poisoning were Ambrosia beetles. The kill, barking ease, and reduction in wood weight could not be correlated with ecological factors. Other forest plants were not visibly affected by the treatments given to neighboring trees. In no cases did bark fall from a standing hemlock or Douglas-fir after the application of poison. This is in contrast to alder, in which the bark of poisoned trees fell away from the standing tree. Measurement of the distribution of (IV) was made with normal and radioactive solutions, indicating rapid absorption and a rise of about 4 feet/hour in the first four hours. The utility of pulpwood from treated and untreated trees was about the same, as judged by the properties of their respective groundwood pulps. The unwashed sapwood of (IV)-treated hemlocks retained less than one part arsenic/50 million parts of wood. Orienting experiments seem to indicate that logs from treated wood are less subject to oceanic teredo attack (for at least 49 days) than are untreated logs. 24 tables, 22 figures, and 8 references in the first and 7 illustrations in the second reference. L.E.W.

BEATER ADDITIVES

STANNETT, V., and JAHN, E. C. The beater addition of polymer latices. Svensk Papperstidn. 57, no. 12: 437-40 (June 30, 1954). [In Swedish; English and German summaries]

The addition of rubber latices (I) to paper was first studied by Kaye in 1922; he found that an improvement in paper was obtained by this treatment. However, only during the last 10 years has the technique of such additions been studied on a large scale, and a great number of methods for the addition and precipitation of (I) developed. In most cases, the polymer particles are negatively charged and easily precipitated by cations, such as aluminum in alum solutions. The influence of the contact time on the strength of the paper has been investigated, and it was found that better results are obtained when the latex is added immediately before sheet formation. Many data in the literature report the amount of (I) added to the furnish, but no information on the retention in the paper is given. A method of estimating the retention of (I) is described. A heat treatment of 9-12 minutes of sheets to which (I) has been added was found to improve their strength properties, wet strength in particular. The influence of beating and the use of (I)-synthetic resin mixtures with different types of pulp have also been investigated. 7 tables and 5 references. E.S.

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. *Plastics Committee.* Beater addition of resins. Tappi 37, no. 7: 167-72A (July, 1954).

In a round-table discussion of the subject, the following six panel mem-

bers presented short talks, after which the meeting was open to questions from the audience and audience participation: Baymiller, John. Suggested mechanism for beater addition, p. 167A; Ramage, Fred. Laboratory experiments with elastomers, p. 167-8A; Walsh, Robert H. Addition of various rubber latices to pulp stock, p. 168A; Howells, T. A. Addition of phenolics, p. 168A; Spencer, Horace. Saturation versus resin addition, p. 169A; and Landes, Chester G. Resin-addition experiences of American Cyanamid Co., p. 169-70A. E.S.

BLEACHING

BORRUSO, DOMENICO, and CERAGIOLI, GIORGIO. The chemistry of bleaching. I. General. Industria carta (Milan) 8, no. 2: 11-16 (February, 1954); Tech. Bull. Tech. Sect., Brit. Paper and Board Makers' Assoc. 31, no. 3: 92-6 (June, 1954). [In Italian and English; second reference abridgment]

In the first article of a series on bleaching, the authors discuss general features, including the chemical nature of the principal constituents of wood, the purpose of bleaching, and the bleachability of different types of pulp. Work with sulfate pulps at the Milan Experimental Station has shown that prehydrolysis improves bleachability and brightness of these pulps. In addition, it has demonstrated that the correlation between permanganate oxidation and chlorine absorption does not always follow an ideal curve and that not only can lignin condensation be avoided during digestion, but the stages of the treatment of the wood can be made to increase the ease of attack by the bleaching agents on lignin. This greater lignin reactivity to the initial alkaline cooking liquor and to bleaching agents may be ascribed partly to the removal of conditions favorable to condensation and partly to the destructive action of the prehydrolyzing liquid which breaks the sensitive bridges between carbohydrates and lignin in the wood structure. Most workers make a clear distinction between the presence of coloring materials and bleachability; in sulfite pulps strong oxidizing agents, such as hypochlorite, will destroy the former in all cases. In kraft pulp, on the other hand, most evidence points to the presence of coloring matter resistant to bleaching, e.g., sulfur derivatives of flavotannins and partially degraded lignin. Thus, kraft pulp treated with hypochlorite alone brightens only very slowly, whereas if the lignin is removed first with chlorine and alkali washing, a following hypochlorite treatment gives a rapid increase in whiteness. 1 figure and 50 references in the Italian original. E.S.

JAYME, GEORG, and ROTHAMEL, LUDWIG. A contribution to the study of three-stage bleaching of sulfite pulps with an alkaline intermediate stage. Wochbl. Papierfabrik. 82, no. 11: 421-6 (June 15, 1954). [In German]

Following a brief review of the pertinent literature on the role and variability of an alkaline intermediate stage used in multistage bleaching (I), experiments with an easy-bleaching and medium-hard spruce Mitscherlich pulp are described in which variations in strength properties and chemical data resulting from one-stage (II) and (I) bleaching (chlorination—hot or cold alkaline extraction—hypochlorite, with extensive washing after each stage) were determined. The results are presented in several tables showing, respectively, the variations in pulp properties brought about by (II) and (I), a comparison of the data obtained by the two bleaching types, and the average percentage of variations to be expected in pulps bleached according to (I). The most significant factors resulting from (I) are: breaking length, elongation, and burst decrease slightly or remain the same; percentage of pentosans (furfural) decreases slightly, and copper number and

resin content decrease appreciably; required beating period, folding endurance, tear-through (Elmendorf), α-cellulose, and average D.P. increase noticeably, the total result being a 6.7% increase in over-all strength number and a 9.4% increase in over-all quality number. The possibility of using a more or less intensive intermediate extraction stage offers a means for producing different pulp types with definite desired properties. Hot alkaline extraction gives a somewhat tougher, more tear-resistant, slower beating, whiter pulp of considerably higher purity with less chlorine requirement in the last stage than a cold-treated pulp. The parchmentizing properties seem to be somewhat reduced by any kind of bleaching. 5 tables and 12 references.
E.S.

BLEACHING—GROUNDWOOD

MOUTON, M.-J., CHOLLEY, J.-M., and MEUNIER-GUTTIN, A. Bleaching mechanical pulp by means of peroxides. Papeterie 76, no. 5: 311, 314-15, 317, 319, 321, 323-4; no. 6: 357, 359, 361, 363, 365, 367, 369, 371 (May, June, 1954). [In French]

Following a brief review of the different procedures for bleaching groundwood pulp, the authors describe the bleaching of mechanical pulps with hydrogen and sodium peroxides. An outline is given of the operating conditions, storage during the bleaching operation, and the final stages of neutralizing to the desired pH. The following factors are considered: stock density during bleaching, the effects of time, temperature, and pH, machinery required and materials of construction, the properties of bleached pulps, and operating costs. The authors point to an improvement in sheet strength of papers made from bleached pulps over those prepared from unbleached pulps. 8 tables, 5 figures, and 4 references.
L.E.W.

BOARD

BORCHGREVINK, GORDON. Product and process variables related to the effect of moisture on hardboard. J. Forest Products Research Soc. 4, no. 3: 142-4 (June, 1954).

On the basis of his experience with the wet-bath process using Asplund Defibrators on Douglas-firwood, the author attempts to evaluate the effect on the hygroscopicity of hardboards of five basic operating variables—the physical and chemical makeup of the wood, the modifying and defiberizing treatment given to the wood, chemical additive treatment and internal sizing, densifying and internal bonding effectiveness of the boards, and subsequent treatment of the boards after pressing.
R.A.S.

BOARD—CONDITIONING

KRUSE, KEITH. Moisture changes with different relative humidity conditions in plant humidification equipment. J. Forest Products Research Soc. 4, no. 3: 148 (June, 1954).

Tests were made to determine the effect of different R.H. conditions on the takeup of moisture by ⅛ (I) and ¼ (II) inch hardboards during the humidification cycle. To obtain the desired moisture content of 5-6% using a cycle of four hours for (I) and six hours for (II), it is necessary to use a wet-bulb setting that will give 80% R.H. within the chamber; dry-bulb temperature had little effect on the rate of humidification. 2 diagrams.
R.A.S.

BOARD—CONVERSION

ANON. A new paper corrugating plant; believed to be widest installed in U.K. Paper Box Bag Maker: 279-80 (June, 1954); Paper-Maker (London) 127, no. 6: 468, 470 (June, 1954).

The paper-corrugator plant of Preston Paper Co., Ltd., Walton-le-Dale, Preston, believed to be the widest continuous corrugated paper plant of its kind in the United Kingdom, is described. The plant, which produces single- and double-faced corrugated board 96 inches wide, is equipped with three machines specially designed by Lang Bridge, Ltd. and a continuous drive arrangement devised by Heenan & Froude, Ltd. 2 illustrations. R.A.S.

GRALLA, LAWRENCE. Setup efficiency in a three-story plant. Am. Boxmaker 43, no. 7: 9-11 (July, 1954).

Efficient operations have been effected in the three-story setup box plant housing Mutual Paper Box Corp., Chicago. The elevators separate the production area—scorers and corner cutters on the first floor, hand bending, stayers, wrappers, and the printing department on the second, and scorers, stayers, wrappers, and the hand-work department on the third—from a storage area for both raw stock and finished boxes on each floor. This arrangement keeps production areas clear of materials and minimizes handling. 1 flowsheet and 6 illustrations. R.A.S.

BOARD, CORRUGATED

MAGNUSON, A. L. Corrugating problems and their solution. Fibre Containers 39, no. 6: 68, 70, 74, 77-9 (June, 1954).

The author makes some general and specific observations and suggestions regarding the solution of production problems in the field of corrugated board. The problems are discussed under the headings: manufacturing equipment—problems caused by worn corrugating and glue rolls, excessive heat, improper ratio of heat:speed:paperboard and glue roll speed:paperboard speed, and disregard of adhesive viscosity; adhesive—excessive gelling and dewatering, poor bond, lack of viscosity control, and nonuniformity; paperboard—variations; and operating personnel—lack of understanding of the basic problems involved. R.A.S.

BOARD MILLS

ANON. Fluting and lining papers from bagasse; new mill in Natal. Paper-Maker (London) 127, no. 6: 454 (June, 1954).

A brief description is given of the new board mill at Felixton in Zululand, South Africa, where corrugating and linerboard for corrugated containers are manufactured from bagasse by the Ngoye Paper Mills (Pty), Ltd. The mill was designed by Celdecor Africa (Pty), Ltd. and houses at present one board machine constructed by Escher Wyss; a second machine is on order. The capacity of the present plant is 20 tons of corrugating and linerboard/day. 2 illustrations. E.S.

ANON. Manchester's new boxboard mill. Fibre Containers 39, no. 6: 53-4, 56, 58, 60 (June, 1954); *cf.* B.I.P.C. 24: 701.

The description of the new Seaboard mill of the Manchester Board & Paper Co., Inc. at Richmond, Va. is similar to that in the previous reference. 23 illustrations. R.A.S.

MOON, D. G. $5 million Southern Paperboard expansion completed. Paper Mill News 77, no. 31: 21-2, 25 (July 31, 1954); Southern Pulp Paper Mfr. 17, no. 8: 69-71 (August, 1954); Tappi 37, no. 8: 106-8A (August, 1954); *cf.* B.I.P.C. 24: 874.

The description of the expansion program of Southern Paperboard Corp., Port Wentworth, Ga. is identical with that given in the previous reference under "Anon." 4 illustrations. E.S.

WATERS, VINCENT F. National Container Corporation's new pulp and paper mills in full operation at Valdosta, Georgia. Southern Pulp Paper Mfr. 17, no. 7: 58-60, 62-4, 66-8, 70-2 (July, 1954); *cf.* B.I.P.C. 24: 787.

The description of the new kraft pulp and board mills is similar to those in the previous references. 5 tables and 20 illustrations. R.A.S.

BOARD SPECIALTIES

PAIGE, RICHARD E. Shipper displays aid sales. Fibre Containers 39, no. 6: 64, 66 (June, 1954).

The benefits to both corrugated box manufacturers and manufacturers of name brand merchandise in the use of a display shipper, a shipping box which on arrival in the retail shop can be easily transformed into a display, are discussed. 3 illustrations. R.A.S.

BOARD TESTING—CHEMICAL

NEWHALL, W. F., ELVIN, E. J., and KNODEL, L. R. Infrared determination of biphenyl in citrus fruits. Anal. Chem. 26, no. 7: 1234-6 (July, 1954); *cf.* B.I.P.C. 23: 238.

Much interest has arisen concerning the biphenyl residues remaining in the peel or juice of citrus fruit packed in cartons impregnated with Phenodor X (a mixture of biphenyl, petroleum wax, and odor counteractants) or similar fungistatic preparations containing biphenyl. A quantitative analytical method is described for the determination of biphenyl in orange oil obtained by steam distillation of mixed peel or juice and refluxing of the sample, whereby orange oil distilled from the fruit acts as the extractant in a continuous liquid-liquid extractor. Use is made of the biphenyl absorption peak in the sample at 14.34 μ in the infrared. This method has the advantage that analyses can be made on samples as small as a single fruit. 1 table, 3 figures, and 4 references. E.S.

BOARD TESTING—PHYSICAL

DONALDSON, G. R. A mill control tester for folding quality of board. Paper Trade J. 138, no. 29: 19-20 (July 16, 1954); *cf.* B.I.P.C. 24: 787.

This description of the "G.D." bending quality tester developed by Australian Paper Manufacturers Ltd. is essentially the same as the previous reference. 1 table and 1 illustration. R.A.S.

KLOOT, N. H. A survey of the mechanical properties of some fibre building boards. Australian J. Appl. Sci. 5, no. 1: 18-35 (March, 1954).

Mechanical tests have been conducted on 20 makes of hardboard and 10 makes of insulating board representing both overseas and local Australian manufacture. A number of properties have been determined for the material in the normal dry condition and on specimens soaked in water for 24 hours. The variation in properties between makes of one type of building board was found to be large, but variation within any one make was generally not greater than for most timber species. Soaking reduces the strength properties of both insulating boards and hardboards, but the latter are relatively less affected. It is suggested that the variability of each of the two principal types of board, together with other factors discussed, indicates the need for setting up standard specifications for this material. 7 tables, 2 diagrams, and 9 references. E.S.

CASTOR OIL PLANT

BHAT, R. V., and JASPAL, NARENDRA S. Indigenous cellulosic raw materials for the production of pulp, paper and board. Part XVII. Writing and printing papers from castor stems (*Ricinus communis*, Linn.). Indian Forester 79, no. 12: 646-51 (1953); *cf.* B.I.P.C. 24: 885-6.

Pilot-plant experiments on the production of writing and printing papers from castor stems are described; bleached pulps were prepared by the sulfate process in yields of 40.9-43.6%. Since the fibers are short, 30% bamboo pulp was added to the furnish. The papers were characterized by good formation and satisfactory strength properties. 5 tables, 1 reference, and 2 sample sheets (one printing and one writing paper made from 70% castor and 30% bamboo pulps). E.S.

CELLULOSE

CLIBBENS, D. A. Cellulose chemistry and the textile industry. J. Textile Inst. 45, no. 5: P173-93 (May, 1954).

In presenting this year's Mather lecture, the author reviews research work on the chemistry of the modified cotton celluloses carried out at the Shirley Institute for more than 30 years. 57 references. E.S.

WARD, KYLE, JR., and STAMM, ALFRED J. Cellulose constants. Tappi 37, no. 7: 121-2A (July, 1954).

Data are supplied in two different answers to a request for modern measurements described in literature on the dielectric constant, insulation resistance, refractive index, heats of combustion and crystallization, and density of cellulose. E.S.

CELLULOSE—DEGRADATION

EDELMANN, KURT. The degradation of cellulose by ultrasonic waves. Faserforsch. u. Textiltech. 4, no. 10: 407-12 (October, 1953). [In German]

After a discussion of the kinetics of macromolecular degradation by ultrasonic waves, experiments are reported in which 0.5% gel solutions of a nitrated beech pulp with an average D.P. of 1060, containing an appreciable amount of fractions with D.P.'s greater than 2500, were irradiated with intense ultrasonic waves of 800 kc./second. The product was then fractionated and the D.P.-distribution curve determined. As the irradiation proceeded, the amount of high molecular fractions decreased. After one hour the average D.P. had fallen to 910 and after four hours to 630 with only a negligible amount of cellulose with a D.P. above 1400. At the beginning of

the irradiation the longest thread molecules were relatively readily and rapidly degraded through the breakage of carbon-to-carbon linkages. After a four-hours' irradiation the D.P.-distribution curve showed a peak at a D.P. of 1000 and this maximum maintained its position and increased progressively in height as irradiation continued. The author believes that the chain breakdown occurs until a limiting chain length is attained and that molecules of this size are able to remain intact while following the vibrations of the solvent. For comparison some experiments were carried out with dry cellulose comminuted in an oscillating mill; the cellulose was then nitrated and fractionated as before. These results show that, unlike in the ultrasonic degradation, comminution proceeds indefinitely with no evidence of the attainment of a limiting chain length. 5 figures and 22 references. F.E.B.

KLEINERT, THEODOR, and MÖSSMER, VIKTOR. The drop in viscosity and D.P. during the treatment of cellulose in the viscose process. Monatsh. Chem. 85, no. 3: 627-36 (June 15, 1954). [In German]

The relationship between D.P. (apparently determined by extrapolation of the specific viscosities at low concentrations with the use of the Staudinger constant) and the cuprammonium viscosity of 1% solutions can be used to indicate the polydispersity of the pulp. The changes in this relationship as the pulp is processed for viscose (oxidation during aging, with either air or hydrogen peroxide) are characteristic for the pulps chosen. 5 tables, 6 figures, and 21 references. K.W.,Jr.

SCHWERTASSEK, KARL. The qualitative application of the iodine sorption to fiber analysis. IX. The relationship between iodine absorption and state of crystallization of cellulose fibers. Faserforsch. u. Textiltech. 4, no. 5: 181-7 (May, 1953). [In German] *cf.* B.I.P.C. 22: 320.

Native (I) and hydrated (II) cellulose adsorb iodine from dilute iodine solutions with the formation of a yellow color which changes to brown and almost black on further iodine adsorption. On desorption (washing) (II) turns blue, (I) violet. Highly amorphous cellulose obtained by crushing of (II) gives on adsorption a violet color which, on desorption, turns blue, whereas (I) turns violet. This difference is used for the detection of chemical damages and lye spots in cotton and viscose textiles. A special characteristic of the amorphous cellulose, produced by crushing, is its cementing action which finds technical application in paper manufacture (wet-beaten pulp). 9 figures and 7 references. F.E.B.

SHARPLES, A. The hydrolysis of cellulose. Part II. Acid sensitive linkages in Egyptian cotton. J. Polymer Sci. 14, no. 73: 95-104 (July, 1954). [French and German summaries] *cf.* B.I.P.C. 24: 703.

It has been shown that a hydrolytic study of the kinetics of chain degradation can be used to detect the presence of acid-labile linkages in cellulose, provided that the amount of ordered or crystalline material in the sample is first reduced by a treatment involving regeneration from alkaline solutions. The results for Egyptian cotton regenerated from benzyl trimethyl ammonium hydroxide in the absence of oxygen show that only a very small fraction of acid-labile linkages—less than one per 2900 glucose residues—can be present in the original chain molecules. It is possible that even this small amount is produced during the alkali treatment. Thus weak bonds of the types proposed by Schulz and Pacsu are definitely absent. Cotton regenerated from cupram-

monium and cupriethylenediamine solutions, however, does contain randomly distributed linkages which are approximately 10,000 times more sensitive to acids than the normal glycosidic type. These appear to be formed by oxidation in alkaline solution from a limited number of special sites in the chain molecules. Assuming the number average value of the D.P. for undegraded cotton to be 2900, the amount of these extranormal linkages is one per 660 glucose residues. 2 tables, 4 figures, and 15 references. E.S.

CELLULOSE—DERIVATIVES

VALENTINE, L. Moisture regain and accessibility of cellulose derivatives. Textile Research J. 24, no. 7: 670-2 (July, 1954).

A recent paper by Gibbons (*cf.* B.I.P.C. 23: 791) uses the relationship between moisture regain and D.S. of cellulose derivatives to calculate the moisture regain of completely accessible cellulose. The present author points out that Gibbons' method can also be used to derive the regain value for completely accessible trisubstituted cellulose derivatives and, hence, to use regain values in determining accessibilities of such derivatives as methylcellulose and cellulose acetate. 2 tables, 1 figure, and 7 references. K.W.,Jr.

CELLULOSE—HEMICELLULOSE

ASPINALL, G. O., HIRST, E. L., and MAHOMED, R. S. Hemicellulose A of beechwood (*Fagus sylvatica*). J. Chem. Soc.: 1734-8 (June, 1954).

Beech hemicellulose A has been shown to contain residues of D-xylose and 4-*O*-methyl-D-glucuronic acid (by conversion into 4-*O*-methyl-D-glucose). The methylated polysaccharide gave on hydrolysis 2,3,4-tri-*O*-methyl-D-xylose, 2,3-di-*O*-methyl-D-xylose, 3-*O*-methyl-D-xylose, and 3-*O*-methyl-2-*O*-(2,3,4-tri-*O*-methyl-D-glucopyruronosyl)-D-xylose in the molar ration of 1:60:7:7. A structure is proposed for the hemicellulose which has a straight chain of approximately 70 1,4-linked β-D-xylopyranose residues with every tenth residue carrying a terminal 4-*O*-methyl-D-glucopyruronic acid residue linked through position 2. E.S.

ASPINALL, G. O., and MAHOMED, R. S. The constitution of a wheat-straw xylan. J. Chem. Soc.: 1731-4 (June, 1954).

Fractionation of wheat-straw hemicellulose yielded a xylan, devoid of arabinose residues, but containing uronic acid residues (about 3%). Hydrolysis of the methylated polysaccharide gave 2,3,4-tri-*O*-methyl-D-xylose (2-4%), 2,3-di-*O*-methyl-D-xylose (93%), and 2-*O*-methyl-D-xylose (3-4%), together with some 2-*O*-methyl-3-*O*-(2,3,4-tri-*O*-methyl-D-glucuronosyl)-D-xylose. It is concluded that this xylan has a straight chain of 40-45 D-xylopyranose residues with a single D-glucopyranuronic acid residue linked as a side chain through position 3. E.S.

CELLULOSE—HYDROCELLULOSE

MILLETT, MERRILL A., MOORE, WAYNE E., and SAEMAN, JEROME F. Preparation and properties of hydrocelluloses. Ind. Eng. Chem. 46, no. 7: 1493-7 (July, 1954).

To facilitate the study of cellulose throughout the entire resistant or crystalline region, simple percolation equipment, utilizing constant-boiling hydrochloric acid at atmospheric pressure, was designed for the preparation of uncontaminated hydrocelluloses. Native, mercerized, and regenerated cellu-

loses were hydrolyzed to give hydrocellulose residues representing from 5 to 99% of the starting material. Each cellulose exhibited a characteristic constant rate of hydrolysis over the entire range. Viscometric measurements of the hydrocellulose residues failed to show a true "leveling-off" D.P., but decreased from 10 to 30% as hydrolysis of the resistant portion progressed. Moisture adsorption by the residues reached a limiting value after approximately one half of the starting material had been removed. Uniform hydrolysis rates and limiting moisture adsorption suggest a constant ratio of surface to volume for the fine structure of a cellulose, whereas the concept that hydrolysis proceeds by lateral attack on the crystallites should lead to an increasing ratio. The described percolation equipment provides a satisfactory means of studying this problem more intensively. 2 tables, 5 figures, and 27 references. E.S.

CELLULOSE—OXYCELLULOSE

MELLER, A. The kinetics of decarboxylation of uronic acids, polysaccharides, and oxycelluloses. Australian J. Chem. 7, no. 2: 157-65 (May, 1954).

Measurements of the rate of carbon dioxide evolution from sulfuric acid solutions of galacturonic acid have revealed that it follows first-order kinetics, but some carbon dioxide is also formed in a side reaction at a constant rate. Glucuronolactone, polyglucuronic acid, and oxycelluloses decarboxylate in essentially homogeneous sulfuric acid solutions according to a two-step reaction scheme, both steps being kinetically first order. This main reaction is accompanied by side reactions in which carbon dioxide is evolved at an approximately constant rate. Mathematical expressions have been derived and applied to compute the constants of the rate equation for the decarboxylation of materials containing uronic acid. 2 tables, 3 figures, and 14 references. E.S.

CELLULOSE—REACTIVITY

LOEB, LEOPOLD, and SEGAL, LEON. The chemical reactivity of ethylamine-treated cotton as indicated by acetylation. Textile Research J. 24, no. 7: 654-8 (July, 1954); *cf.* B.I.P.C. 24: 665.

The chemical reactivity of cotton decrystallized by treatment with anhydrous ethylamine has been compared with that of the untreated control cotton and with mercerized cotton. The degree of acetylation, achieved in the various materials under comparable conditions, has been taken as the criterion of chemical reactivity. The amine-treated cotton showed only slightly greater reactivity than the untreated control if air dried before measurement. To maintain the full chemical reactivity of the decrystallized cotton, it is necessary after removal of the amine to maintain the cotton wet with nonaqueous solvents. When maintained wet with hexane or pyridine until acetylated, the reactivity of the amine-treated cotton was found to be slightly greater than that of mercerized cotton which had been maintained water-wet after mercerization. In a series of short-duration acetylations (15 minutes at 25°C.) with a glacial acetic acid presoak it was found that the acetyl content increases strongly as a function of presoak time. In one series the acetyl content was found to increase from a trace to 32.5% as the presoak time was increased from 0 to 15 minutes. The marked effect of a brief (5-minute) acetic acid presoak upon the degree of acetylation achieved in amine-treated cotton appears to be due principally to the swelling action of the acid on the cotton. 5 tables and 12 references. E.S.

CELLULOSE ESTERS—NITROCELLULOSE

BOYER-KAWENOKI, FANNY. The unusual behavior of urea in reaction with cellulose. Bull. soc. chim. France no. 6: 809-11 (June, 1954). [In French]

Although cellulose nitrate absorbs unsubstituted ureas from cyclohexane, it does not absorb ordinary urea from water, nor does cellulose. Cellulose, however, fixes 0.5 moles of water per glucose unit. The author concludes that this indicates an abnormal structure of urea in aqueous solution and that it confirms the existence of a hydrate of cellulose containing one molecule of water per cellobiose unit. 4 figures and 9 references. K.W.,Jr.

CELLULOSE ETHERS

WEAVER, J. W., MACKENZIE, C. A., and SHIRLEY, D. A. Alkylation of cellulose with esters of *p*-toluenesulfonic acid. Ind. Eng. Chem. 46, no. 7: 1490-3 (July, 1954).

Preliminary work is described in which the optimum conditions for the methylation of cellulose with methyl *p*-toluenesulfonate and the alkylation with other esters under these conditions are established. The reactivity of the *p*-toluenesulfonates with alkali cellulose diminishes as the length of the alkyl group increases. With a ratio of three moles of methyl *p*-toluenesulfonate per glucose hydroxyl and sufficient reaction time, a product could be obtained which contained 2.7 methoxyl groups per glucose unit. With a similar mole ratio, the ethyl ester brought about a substitution of 1.0 group per glucose unit, whereas the propyl ester gave only 0.4 group under similar conditions. Both the butyl and phenyl esters were found to be ineffective. 3 tables, 4 figures, and 13 references. E.S.

CHEMICAL TESTING—CARBOHYDRATES

YEMM, E. W., and WILLIS, A. J. The estimation of carbohydrates in plant extracts by anthrone. Biochem. J. 57, no. 3: 508-14 (July, 1954).

The anthrone reaction has been investigated with a range of naturally occurring hexoses and pentoses. The course of color production varies widely with different sugars, and the test is much less sensitive for pentoses than for hexoses. Sugar mixtures give results agreeing closely with those expected from the color production of the individual sugars. Under the conditions used there is no evidence of serious interaction of hexoses and pentoses. For the estimation of soluble sugars in plant extracts the method yields results comparable with those obtained with the copper reagent, but includes the sugars of stable glycosides which may constitute a large proportion of the soluble carbohydrates in some plant tissues. Used in conjunction with chromatographic identification, the anthrone method is of particular value when limited quantities of tissue are available. 4 tables, 7 figures, and 17 references. E.S.

CHEMICAL TESTING—CELLULOSE—ACCESSIBILITY

SCHWABE, KURT, and FRIND, HORST. A quick method for the determination of the readily accessible fraction of celluloses. Faserforsch. u. Textiltech. 4, no. 3: 91-9 (March, 1953). [In German]

By determining the dependency of the course of time of the cellulose hydrolysis on the acid concentration, temperature, stirring speed, and cellu-

lose:liquor ratio, a new rapid method for the determination of the readily accessible fraction in celluloses has been developed, in which the hydrolysis products are determined by oxidation with chromic acid. A sample of 5 grams of airdry pulp is added to 200 ml. of 3.75 *N* sulfuric acid in a three-neck flask equipped with a stirrer (1000 r.p.m.), a reflux condenser, and a thermometer, and heated on a boiling water bath (inner temperature 97°C.). Every 15 minutes after the addition of the pulp, five samples are removed with a wide-mouth pipette, immediately cooled, filtered through a G4 fritted filter until clear, and the filtrate is oxidized by adding 10-15 ml. of 0.25 *N* potassium bichromate solution, heating the mixture, and then carefully adding 20 ml. of concentrated sulfuric acid. After five minutes 80 ml. of water is added, the mixture cooled, and the excess potassium bichromate titrated with 0.1 *N* ferrous ammonium sulfate solution against Ferroin. The amount of hydrolyzed cellulose (*C*) is calculated according to the following equation: $C = v \times f \times L/a \times 100/E$ in which v is the ml. of potassium bichromate consumed, f the factor for calculating the mg. of cellulose (1 ml. of bichromate = 0.765 mg. of glucose), L the total volume of solution (usually 200 ml.), a the ml. of filtrate used (usually 5 ml.), and E the amount of cellulose used in mg. The mathematical evaluation of the hydrolysis-time curves gives an empirical relationship which allows the determination (from a single determination of the dissolved portion after a hydrolysis period of 1.5 hours) of the amount of the readily accessible (amorphous) fraction. The results obtained with the method agree sufficiently with those obtained by other methods. 8 tables, 10 figures, and 50 references. F.E.B.

CHEMICAL TESTING—PAPER—GUMS

LEECH, HOWARD J. Measurement of retention of locust bean gum by analysis of sugar units. Tappi 37, no. 7: 290-4 (July, 1954).

A new analytical method has been developed for the determination of the locust bean gum content of paper. This new method possesses the advantage that it can be used for testing prepared paper samples and, therefore, measures the true gum content of the paper. The steps involved are hydrolysis with dilute sulfurous acid, recovery of sugars, separation of the sugars by paper partition chromatography, and determination of the sugars by oxidation with sodium periodate. Although particular conditions have been chosen in this work, the method is adaptable to a variety of applications. 3 tables and 15 references. E.S.

CHEMICAL TESTING—PULP—ACID NUMBER

ANT-WUORINEN, OLLI, and VISAPÄÄ, ASKO. Improved technique for determination of carboxyl groups in cellulose. Paper and Timber (Finland) 36, no. 5: 233-41, 245 (May, 1954). [In English] *cf.* B.I.P.C. 24: 876-7.

The carboxyl groups of cellulose are difficult to titrate, because the pH value of a salt solution with suspended cellulose fibers does not represent the total acidity of the cellulose sample in question and because alkali-consuming side reactions interfere, unless the determination is carried out at pH 7. The atmospheric carbon dioxide, as well as the carbon dioxide and bicarbonates of water, interfere with the determination, and this effect has to be eliminated. One of the authors had previously developed a double-funnel system (*cf.* B.I.P.C. 21: 769-70) for the determination of carboxyls in cellulose. The technique and apparatus have been further perfected to improve the efficiency and overcome the disturbing effects mentioned above.

The electrometric part of the new apparatus consists of a Beckman pH meter connected with a Honeywell-Brown recording potentiometer and a feed-back potential device. In place of the former double funnel (the sintered glass bottom of which is likely to participate in ion exchange and cause a small error), a reactor of improved design is employed. The operation involves the washing of the cellulose sample to a certain criterion, the removal of the carbon dioxide by nitrogen, the actual titration, and the blank test. The criterion depends on the difference between the conductivity under nitrogen of the solution before and that after contact with the cellulose sample. This is given in terms of Siemens units and may vary from the usual 0.1 up to 0.5. The authors describe a short cut to be used for the correction of the error caused by bicarbonate impurities in the salt solution. The reproducibility of the results obtained with three different kinds of cellulose (viscose rayon, Whatman ashless tablets, and cotton linters) is presented in tabular form; other tables prove the fact that a cellulose suspension at all pH intervals requires more alkali than the blank salt solution to reach the next pH value. 3 tables, 18 figures, and 3 references. E.S.

CHEMICAL TESTING—PULP—CUPRAMMONIUM VISCOSITY

BROWNING, B. L., SELL, L. O., and ABEL, WM. Cellulose solvents for viscosity measurements; the effect of copper and base concentrations in cuprammonium and cupriethylenediamine solutions. Tappi 37, no. 7: 273-83 (July, 1954).

Copper-base solutions covering the composition ranges of 7.5-35 grams/liter of copper and with 125-250 g./l. of ammonia or 50-150 g./l. of ethylenediamine have been examined as solvents for cellulose. Cuprammonium solutions containing more than 30 g./l. of copper or 200 g./l. of ammonia are not stable enough for practical use. If the copper concentration exceeds 10 g./l., sucrose is necessary to stabilize the solution, and decomposition at 23°C. then occurs only slowly. In qualitative tests, chemical cotton and a rayon pulp dissolved completely in all the cuprammonium solutions containing 10 g./l. or more of copper, but a high-polymer cotton and bleached semichemical pulp left some undissolved residues unless the solutions contained 25-30 g./l. of copper. Cupriethylenediamine solutions dissolved cellulose only if the base-copper molar ratio was within the range of 2:1 to 3:1, and the copper content was 0.5-1 *M*. The specific viscosities of celluloses in cuprammonium solutions are markedly decreased by increase in ammonia contents over the range of 98-176 g./l., and are affected only slightly by copper contents over the range of 14-28 g./l. The compositions of cupriethylenediamine solutions which dissolve cellulose satisfactorily are rather limited, and the TAPPI solvent 1 *M* in base and 0.5 *M* in copper was the best of the solvents tested. The specific viscosity decreases markedly as the copper concentration is increased from 0.5 to 1.0 *M*, with the base-copper ratio of 2:1. Increase in the base-copper ratio generally increases the specific viscosity. Tests on chemical cotton showed that the intrinsic viscosity is dependent upon the copper and base concentrations used in the solvent. However, no feasible concentrations of cuprammonium and cupriethylenediamine solutions were found which would yield identical values for the specific viscosity in the two solvents. 3 tables, 8 figures, and 26 references. E.S.

CHEMICAL TESTING—PULP—MERCURY

CARLSON, OVE T., and BETHGE, PER OLOF. Determination of mercury in pulp and paper. Svensk Papperstidn. 57, no. 11: 405-8 (June 15, 1954). [In English; German and Swedish summaries]

A new method for the determination of mercury in pulp and paper is described. The sample is comminuted by hand and moistened with distilled water (important to avoid later violent reactions with perchloric acid), then mixed with a solution of equal parts of sulfuric and perchloric acids, and subjected to wet combustion in a special apparatus of Pyrex glass which is described and illustrated by a sketch. When combustion is complete, the cooled contents of the reflux collector and the digestion flask are mixed and diluted with ammonium hydroxide to pH 1. Oxidizing substances still present are reduced with hydroxylamine sulfate for about 10 minutes, after which period the solution (I) is cooled to room temperature. The mercury content of (I) is determined colorimetrically with dithizone according to the method of Irving and co-workers (*cf.* J. Chem. Soc.: 541-7 [1949]). The procedure has been found rapid, reliable, and reproducible. 1 table, 2 figures, and 9 references. E.S.

CHEMICAL TESTING—PULP—REDUCING CONSTITUENTS

SCHWABE, KURT, and SCHRÖDER, HEINZ. A new electrolytic method for the determination of the reducing constituents of pulps. Faserforsch. u. Textiltech. 4, no. 6: 261-3 (June, 1953). [In German]

Sodium hydroxide (100 ml. 1%) is heated to a boil in a 300-ml. Erlenmeyer flask to expel the air, then the finely divided pulp (corresponding to 1 gram of ovendry pulp) is added, the flask closed with a Bunsen valve and boiled gently for 15 minutes. The cooled contents are filtered through a G3 fritted filter and the filtrate is kept in a closed flask. In the meantime, 80 ml. of 1% sodium hydroxide is electrolyzed with stirring for 10-12 minutes in a 100 ml. beaker with two platinum electrodes (each 2 sq. cm. in size) and a bath voltage of 0.2 v. until the current and the bath voltage are constant. Exactly 15 minutes after starting the current, 10 ml. of the above filtrate is added and the change in current intensity measured every minute until the maximum is reached. The difference between the maximum and the constant residual current is used as a measurement for the reducing substances in the pulp. The maxima obtained with different pulps are compared with the corresponding copper numbers; the copper number can be found by means of a standard curve. Similar agreements between current and copper number are found with bleached and unbleached sulfite and sulfate pulps. The method may be useful for routine control of fiber degradation in the bleaching of pulps. 1 table, 4 figures, and 9 references. F.E.B.

CHEMICAL TESTING—SULFUR

LANDSBERG, HENRY, and ESCHER, EDWARD E. Potentiometric instrument for sulfur determination. Ind. Eng. Chem. 46, no. 7: 1422-8 (July, 1954).

An automatic instrument is described which continuously records trace quantities of oxidizable sulfur compounds in the range of 0.1 to several hundred p.p.m. by volume in gases and atmospheres. Coulometric titration with electrolytically generated bromine is used, and the titration is electronically controlled at a potentiometric balance point. Various applications in the natural gas, process, and air pollution fields are discussed. 3 tables, 10 figures, and 8 references. E.S.

CHEMICAL TESTING—WOOD

WILSON, J. W. Fibre technology—II. A critical survey of labora-

tory wood maceration techniques. Pulp Paper Mag. Can. 55, no. 7: 127-9 (June, 1954); *cf.* B.I.P.C. 24: 798.

The author discusses critically the shortcomings of existing wood maceration techniques and emphasizes the need for improved methods. At the University of British Columbia research has been started to develop new methods; the first phase has been the initiation of a comprehensive survey and comparison of the active oxygen (peroxygen) chemicals. 55 references. E.S.

CHEMICAL TESTING—WOOD—LIGNIN VALUE

MEEK, WAYNE L. A new filtering adapter speeds up the determination of lignin. J. Forestry 52, no. 6: 450-1 (June, 1954).

An alundum crucible specifically designed to speed up the filtration step in the 72% sulfuric acid determination of lignin is described; it provides a quick and simple vacuum seal, which can be rapidly and smoothly broken. 1 illustration. E.S.

CHROMATOGRAPHY

MOILANEN, MAURI, and RICHTZENHAIN, HERMANN. Paper chromatography of the saccharinic acids. Acta Chem. Scand. 8, no. 4: 704 (1954). [In German]

In a preliminary note, the authors describe the separation of five C_6-saccharinic acid lactones, 1,3-dihydroxybutyric acid and lactone, and lactic and glycolic acids on Whatman No. 1 filter paper with a 10:1:1.3 solvent mixture of ethyl acetate-water-acetic acid. The paper is sprayed with ammoniacal silver nitrate to show the various spots. The free C_6-acids move less rapidly on the sheet than do the corresponding lactones (R_f values of 0.14-0.15 and 0.30-0.41 respectively). The acid mixtures obtained by the action of 8 *N* sodium hydroxide on aldohexoses or aldopentoses contain both C_6- and C_5-acids. The method has been applied to sulfate black liquor with partial success, and a few crystalline fractions were obtained. The development of a two-dimensional method is in progress. 3 references. J.W.G.

COLOR-BLINDNESS

HARDY, LEGRAND H., RAND, GERTRUDE, and RITTLER, M. CATHERINE. H-R-R polychromatic plates. J. Opt. Soc. Amer. 44, no. 7: 509-23 (July, 1954).

A description is given of the H-R-R plates and evaluation of the test as a device (*a*) to separate those with defective color vision from those with normal color vision, (*b*) to classify the type of defect (qualitative diagnosis), and (*c*) to indicate the extent of the defect (quantitative diagnosis). For this evaluation 780 subjects were used, not selected on the basis of a statistical survey. The H-R-R plates are shown to be in complete agreement with the A.O. test (revised selection) in separating the subjects into two groups: 150 with defective and 630 with normal red-green vision. The test agrees remarkably well with the Nagel anomaloscope in classifying the subjects with defective red-green vision into deutan and protan types. It rates 23% of these subjects as having mild defect, 31% as having medium defect, and 46% as having strong defect. For the subjects with defective color vision, a detailed comparison is presented of the qualitative classifications into deutan and protan types yielded by the H-R-R plates with those made by the Nagel anomaloscope, the Ishihara test, and the dichotomous test. A further comparison is made for these subjects between the quantitative estimates of extent of defect by the H-R-R plates and performance on various aptitude

tests which were designed to select those color-defective persons who can meet the color requirements of specific but different tasks. It is shown that the percentage who pass these tests significantly and consistently decreases as the severity of defect shown by the H-R-R plates increases. The practical importance of a simply administered, comprehensive test, such as is provided by the H-R-R plates, to vocational selection and guidance is discussed, and an example given of their application in the radio and television industry. 11 tables, 5 figures (including 1 record sheet), and 18 references. E.S.

COMPRESSED AIR

DICK, GEORGE M. The use of compressed air on high speed paper machines. Paper Mill News 77, no. 27: 114-15, 117-18, 138 (July 3, 1954); Southern Pulp Paper Mfr. 17, no. 8: 46, 48, 50-2 (August, 1954); Can. Pulp Paper Ind. 7, no. 8: 8-10, 12-13 (August, 1954).

The author discusses present uses of compressed air on the paper machine, calenders, and reels, and lists auxiliary applications in pulp mills, including stock preparation, liquid-recovery systems, instrumentation, compressors, etc. 5 illustrations. E.S.

COOKING PROCESS

BRINK, DAVID LIDDELL. The cooking process: XIII. The effect of aqueous solutions of pure sodium hydrosulfide on the constituents of wood. (Univ. of Minnesota). Univ. Microfilms (Ann Arbor, Mich.), Publ. No. 8114: 342 p.; Dissertation Abstrs. 14, no. 6: 928-9 (June, 1954); *cf.* B.I.P.C. 22: 171.

Aspenwood was heated with a 7% sodium hydrosulfide solution at a wood to liquor ratio of 1:10 and 180°C. for two hours, the filtered mother liquor acidified with hydrochloric acid, and extracted with butanol. From the butanol extract phenol, catechol, 2,6-dimethoxyphenol, and acetovanillone were isolated, and the presence of *o*-cresol was tentatively indicated. The residual wood was acidified and extracted with butanol at 20°, giving 53.9% of a pulp with 85% α-cellulose and 0.4% lignin. Although it is claimed that sodium hydrosulfide alone is not a pulping agent, it cleaves protolignin linkages in aspenwood. Because of the formation of hydrogen sulfide, a system is formed which, on account of its reducing properties, minimizes the repolymerization of the cleavage products. In the normal kraft cook repolymerization occurs under the strongly alkaline conditions as is shown by the relatively low yields of simple degradation products. F.E.B.

CORROSION

WEHRLE, ARMIN A. Corrosion experiences with humidifier equipment. J. Forest Products Research Soc. 4, no. 3: 145 (June, 1954).

To prevent corrosion of the various exposed parts in a continuous humidifier in a hardboard plant, an acid-resistant vinyl paint was applied to the walls of the spray tower and on the wickets and their angle-iron supports; an asphalt coating was applied to the inside of the housing; and chemicals were used to maintain a neutral condition in the water. 1 flowsheet. R.A.S.

COST—ACCOUNTING

NOEL, CAY. Costing pulp and paper. Pulp Paper Mag. Can. 55, no. 7: 108-10 (June, 1954).

The function of a cost department is to provide a means for sufficient control of production and costs and to present a fair allocation of costs, so as to obtain a true total cost of the products for a given period and thereby a correct profit or loss. A method of obtaining efficient cost control by breaking down all phases of manufacturing processes, overhead, and administrative expense into cost centers, each one operating under an executive who is totally responsible to higher management for all costs charged to his center, is described. R.A.S.

DIE-CUTTING

SCOTT, M. LEE. Die cutting in the setup box plant. Am. Boxmaker 43, no. 7: 14-15 (July, 1954); Fibre Containers 39, no. 7: 64, 68, 70 (July, 1954); Am. Printer 135, no. 8: 28-9, 74 (August, 1954).

The advantages and ease with which a die-cutting plant can be added to a setup paper box manufacturing plant are emphasized. Die-cutting jackets can be applied to fit most presses which the manufacturer already possesses; die-cutting presses for special purposes are listed. The services of a reputable diemaker, who can serve as a consultant, should be procured. 1 illustration. R.A.S.

DIGESTERS

KESSLER, EUGEN, and VERSEN, ERNST. Stainless-steel plated pulp digesters. Das Papier 8, no. 13/14: 285-8 (July, 1954). [In German]

The chemical suitability of welded stainless-steel plating for the lining of sulfite, sulfate, and nitric acid digesters is discussed; the mechanical behavior of such linings, correct installation, and maintenance are described. Advantages include the better utilization of the digester volume, smooth inner surfaces which permit rapid discharging of the digester contents, insensitiveness to abrupt temperature changes, the absence of frequent repairs and shutdowns, and long service life; these offset the high first-installation cost. 4 illustrations. E.S.

DISINFECTION AND DISINFECTANTS

SHEMA, B. F., and CONKEY, J. H. The effect of different pulps on the biological activity of phenylmercuric acetate. Tappi 37, no. 7: 294-8 (July, 1954).

Ten different pulps were investigated for their effects on the biological activity of phenylmercuric acetate. It was found that, in general, the unbleached grades of pulp significantly reduce the biological activity of phenylmercuric acetate. It was also found that bleaching removes or chemically changes the inactivating principle in the pulp. For the Mitscherlich sulfite pulp it was found that the peroxide bleaching process does not remove or change the inactivating principle to the same degree as the hypochlorite bleaching process. The addition of alum to unbleached pulps usually increases the toxicity of phenylmercuric acetate, whereas in some of the bleached pulps there is a significant reduction in biological activity. Alum in distilled water is more toxic to the test organism than when it is added to a 1% pulp suspension. The hemicelluloses of loblolly pine and black spruce have no effect upon the biological activity of phenylmercuric acetate. The biological activity of phenylmercuric acetate is reduced by such lignin complexes as native lignin, alkali lignin, thiolignin, and calcium lignosulfonate. 2 tables and 12 references. E.S.

DYES AND DYEING

CAREY, B. J. R. The colouring of paper stock. Paper-Maker (London) 127: 9-12, 14-16, 18-22, 24-6 (Mid-summer, 1954); *cf.* B.I.P.C. 24: 189.

This is the unabridged text of the article. 5 tables, 7 figures, and 12 references. E.S.

ENZYMES

REESE, ELWYN T., and GILLIGAN, WILLIAM. The swelling factor in cellulose hydrolysis. Textile Research J. 24, no. 7: 663-9 (July, 1954); *cf.* B.I.P.C. 24: 443.

There is an enzyme (S factor) in the cellulolytic filtrates of fungi which can attack the primary wall of the cotton fiber, so that enzyme-treated fiber swells much more in 18% sodium hydroxide than does untreated fiber. The relationship of S factor to the several hydrolytic enzymes (*Cx*) present in cellulolytic filtrates varies with the organisms, with growth conditions, and with purification procedures. Current data favor the view that S factor represents the action of a particular *Cx* type. 3 tables, 5 figures, and 14 references. K.W.,Jr.

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. Dextrinizing value of enzymes (enzyme activity). Tappi 37, no. 7: 113-15A (July, 1954).

The full text of TAPPI Suggested Method T 643 sm-54 is presented; it covers an assay method for measuring the dextrinizing value of amylolytic enzymes (especially of nonmalt origin, particularly bacterial). Apparatus, reagents, procedure, and method of reporting are described in detail. 2 tables and 2 references. E.S.

FIBER—INDENTIFICATION

LUNDEGARD, MARJORIE, and ROSEBERRY, ELIZABETH D. A qualitative analysis of the synthetic fibers. Am. Dyestuff Reptr. 43, no. 4: 93-7 (Feb. 15, 1954); Tappi 37, no. 7: 117-21A (July, 1954).

Easy, accurate, and reproducible procedures for the identification of the synthetic fibers nylon, Dacron, Orlon, Acrylan, X-51, Dynel, saran, and polyethylene are described, covering (*a*) the solubility of these fibers in chemical reagents of various concentrations and at different temperatures, (*b*) microscopical tests, and (*c*) miscellaneous tests useful for the purpose. 7 tables, 1 figure, and 4 references. E.S.

FIBER—STRUCTURE

DOLMETSCH, H. Preformed cleavage plane systems in native cellulosic fibers. Melliand Textilber. 35, no. 7: 721-5 (July, 1954). [In German; English, French, and Spanish summaries]

The author conceives of two preformed cleavage systems in cellulose, the interfibrillar spaces running longitudinally and a transverse system of regularly arranged weak spots. This concept is developed by a series of microscopic and electron-microscopic studies on variously swollen and degraded samples of spruce pulp. 16 photomicrographs and 9 references. K.W.,Jr.

FINISHING ROOM

YOUNG, R. S. Lowering finishing room costs. Paper Mill News 77, no. 27: 92, 94, 96-7 (July 3, 1954); Paper Trade J. 138, no. 26: 46, 48, 50, 52 (June 25, 1954); Southern Pulp Paper Mfr. 17, no. 7: 88-93 (July, 1954).

The author emphasizes the fact that the finishing division of a mill offers the greatest potential for cost reductions, although the degree to which this can be accomplished will differ greatly from mill to mill because of widely varying finishing operations. The most lucrative opportunities lie in the reduction and control of waste or shrinkage and in the reduction of labor costs through a methods-improvement program. Any mill can capitalize on these vast opportunities without the need of large cash expenditures. The desire and strong determination, a well-designed plan developed by the mill's own personnel, a first-class selling job by the supervisory people and professional engineers, and a complete understanding of the human problems involved, including the patience and common sense required to work them out successfully, are all that is needed. 5 charts. E.S.

FIR

KENNEDY, R. W., and WILSON, J. W. Studies on smooth and cork-bark *Abies lasiocarpa*. I. Fibre length comparisons. Pulp Paper Mag. Can. 55, no. 7: 130-2 (June, 1954).

The authors report on an investigation undertaken to determine the pulp quality of the wood, as represented by tracheid length, of two forms of alpine fir *Abies lasiocarpa* (Hook.) Nutt. found in the interior of British Columbia. The following conclusions were reached: (1) Fibers from the wood of smooth-bark trees (I) at breast height are significantly longer than those of cork-bark trees (II) at comparable age levels. (2) Within equivalent age increments of (I), fiber length is significantly greater in those trees exhibiting a faster rate of growth. (3) Because of slower growth rate, (II) have longer fibers up to a diameter of 4 inches, after which the trend reverses and (I) show superior length. (4) Fibers of (II) reach a maximum length between the 60th and 115th annual increment, whereas (I) do not attain a maximum length during the first 110 years. (5) It is probable that merchantable (I) will consistently show fiber lengths greater than those of (II). 2 tables, 6 figures, and 3 references. E.S.

FOAM

HÄCKER, GERHARD. Foam prevention in the paper industry. Das Papier 8, no. 13/14: 290-1 (July, 1954). [In German]

The occurrence of foam during paper manufacture, its harmful consequences, and antifoaming agents, with particular reference to "Spumex" introduced into the beater after the alum addition, are discussed very briefly. E.S.

FOLDING BOXES

HAMMANS, ERNST GÜNTHER. The folding box, its shape, manufacture, and use. Allgem. Papier-Rundschau no. 10: 531-4; no. 11: 575-9; no. 12: 622-4 (May 20, June 5, 20, 1954); Verpackungs Rundschau no. 6: 294-7; no. 7: 338-41; no. 8: 390-3 (June-August, 1954). [In German]

The author discusses the demands placed on modern folding boxes, standard and special forms (including the Eco and Hermetet packages), their manufacture from sheet or roll, raw materials employed (boards and metal or plastic foils laminated to board) and auxiliary materials (notably adhesives or stitching wire), their advertising value and sales appeal (printing and converting methods), packaging applications by manual or semi- or fully automatic procedures, closures, and future trends. 21 diagrams. E.S.

NEWELL, JOHN C., JR. The obvious answer was the folding box. Am. Boxmaker 43, no. 7: 12-13 (July, 1954).

A folding carton with a large transparent-film window, used by Allen V. Smith, Inc. for packaging its line of dried foods, has numerous advantages over the transparent-film bag used previously, the most important advantage being a reduction in breakage. 1 illustration. R.A.S.

FOREST FIRES

KERR, ED. Spotting forest fires with television. Sci. Monthly 79, no. 2: 129-30 (August, 1954).

A brief reference is made to the promising results in spotting forest blazes by television reported by the Louisiana Forestry Commission, which is experimenting with an assembly called "detecto-vision." The possibilities for spotting arsonists are also mentioned. 2 illustrations. E.S.

FORESTS AND FORESTRY

HAGBERG, ERIK. The coniferous forest resources and the provision with raw materials of the forest industries in southern and middle Sweden. Svensk Papperstidn. 57, no. 11: 393-8 (June 15, 1954). [In Swedish]

Forest resources and conditions in the different provinces of southern and central Sweden are reviewed. 1 table, 8 diagrams, and 1 map. E.S.

SOUTHERN PULPWOOD CONSERVATION ASSOCIATION. [Sampling] Southern Pulp Paper Mfr. 17, no. 5: 66, 68, 70-2 (May, 1954).

Various problems in the general field of forests and forestry are discussed by representatives of companies in the South. Cutting and sampling procedures are described by the first four authors and methods of developing public interest in forestry are covered by the final author in the following articles, listed by authors and titles: Boutwell, S. A. Experiences of Gair Woodlands Corporation with SPCA cutting sampling—1953, p. 66, 68; Richardson, R. R. Problems and comments on the sampling system [Riegel Woodlands Corp.] p. 68, 80; Dolhonde, Paul E. The sampling system [Gaylord Container Corp.] p. 70-1; Stockman, James F. Sampling procedure [The Champion Paper and Fibre Co.] p. 71; and Verdery, W. H. Pulpwood Dealers' conservation plans, p. 71-2. R.A.S.

FORESTS AND FORESTRY—EDUCATION

NICHOLSON, G. W. E. Union Bag's educational program in forestry. Paper Ind. 36, no. 4: 389-90 (July, 1954).

The author outlines the forestry education program of the Union Bag & Paper Corp., which includes a free pine seedling distribution plan, forestry training camps, scholarships and fellowships, publication of forestry pamphlets,

school forests, and a plant visitation program for 4-H Clubs and Future Farmers of America groups. R.A.S.

FUNGI

FRITZ, CLARA W. Fructification of *Poria cocos* (Schw.) Wolf on poplar. Can. J. Botany 32, no. 4: 545-8 + 1 plate (July, 1954).

The subterranean sclerotia of *Poria cocos* (Schw.) Wolf have been known in North America for more than 150 years, but sporophores of the fungus are rare. The author reports the first fruit bodies of this fungus found in Canada. They developed on poplar pulpwood bolts during storage; the history of the logs from the time of cutting up to the finding of the sporophores is recorded. 2 illustrations and 4 references. E.S.

GLYCERIN

LESSER, MILTON A. Glycerine. Soap Chem. Specialties [previously Soap Sanit. Chemicals] 30, no. 7: 37-40 (July, 1954).

Among the many new and expanded uses of glycerin (cleaners and polishes, stain removers, caulking compounds, artificial sponges, etc.) is listed a formulation for making a high wet- and dry-strength paper suitable for dusting and polishing furniture and the like (*cf.* U. S. patent 2,495,066 [Jan. 17, 1950] issued to Jones; B.I.P.C. 20: 457). 21 references. E.S.

GROUNDWOOD MILLS

SISLER, GEORGE C. Abitibi's new grinder room. Pulp Paper Mag. Can. 55, no. 7: 106-7 (June, 1954).

The new grinder room and equipment installed at the Sault Ste. Marie, Ont. division of Abitibi Power and Paper Co. is described. The wood-grinding facilities comprise six Waterous Great Northern grinders equipped with Norton pulpstones, two Allis-Chalmers vibrating-type screens, and a Jeffrey shredder. Changes were also made in the groundwood mill to accommodate the increased capacity. 6 illustrations. R.A.S.

GROUNDWOOD PULP

BRANDAL, J., and OTTAR, H. Results from grinding of sawmill waste. Norsk Skogind. 8, no. 6: 210-16 (June, 1954). [In Norwegian; English summary]

Spruce slabs and edgings from logs which prior to sawing had passed through an Anderson knife barker were ground in pocket grinders on a mill scale. The pulp produced exhibited about the same quality characteristics as pulp from ordinary pulpwood, except for a higher shive content. The bull-screen rejects and the screenings increased considerably during the grinding of the waste. Production dropped slightly when thin slabs and edgings were ground, whereas no significantly different production figures were obtained when thick slabs and ordinary pulpwood were ground together. 1 table and 10 figures. E.S.

GUMS AND RESINS

ANDREWS, P., and JONES, J. K. N. The isolation of oligosaccharides from gums and mucilages. Part II. J. Chem. Soc.: 1724-6 (June, 1954); *cf.* B.I.P.C. 24: 447.

Hydrolysis of lemon gum yields a mixture of monosaccharides, and acidic

and neutral oligosaccharides, including one to which the structure 4-*O*-(4-*O*-methyl-α-D-glucuronosyl)-L-arabinose has been assigned. E.S.

DAUGHERTY, P. M. The constituents of pine oleoresins, a review. Georgia Inst. Technol. State Eng. Expt. Sta. Bull. 19: 26 p. (1954).

A literature review of the chemical composition of the oleoresins of longleaf (*Pinus palustris*) and slash (*P. caribaea*) pine is presented under the subdivisions: resin acids, the turpentine fraction, and other neutral compounds. 2 tables, 1 figure, and 39 references. E.S.

HARD WOODS

PETERI, ROBERT. Determination of the papermaking value of tropical woods. Chimie & industrie 71, no. 6: 1140-3 (June, 1954). [In French]

As the result of his experience in the laboratories of the Service des Recherches de la Régie industrielle de la Cellulose coloniale, the author concludes that chemical analyses *per se* are a poor index of the possible pulping properties of a colonial tropical hardwood. A wood (like *Scytopetalium latifolium*) may contain 35.2% lignin and still be quite readily delignified without excessive sodium hydroxide consumption or screenings, whereas another (like *Dialium densiflorum*) containing only about 27.5% lignin, may require more alkali for delignification and still give only a hard pulp with a high percentage of screenings. Other examples are given, which indicate that analytical criteria are unsatisfactory. The so-called biometric assay involving fiber measurements gives a better index; however, here too, the author sounds a warning note. For example, the tear resistance of a pulp from *Dacryodes klaineana* (average fiber length 0.95 mm.) was far greater than that from *Uapaca esculanta* (average fiber length 2.6 mm.). The relationship between the length and width of the fiber seems more important than its length. Finally, the author discusses very briefly the importance of actual kraft pulping experiments in gaging the value of a tropical wood. About 25 such woods from French Africa may be interesting to the papermaker from about 80 that were examined analytically, morphologically, and in papermaking experiments; the author however does not include such a list. L.E.W.

HEALTH

SCHWEISHEIMER, W. The tired businessman. Can. Pulp Paper Ind. 7, no. 7: 26, 50 (July, 1954).

Reasons why businessmen become overtired, ailments resulting from overwork, and methods of relaxation and relieving tension, particularly for ensuring a restful night's sleep, are discussed. R.A.S.

HEATING (INFRARED)

LE GUËN, The possibilities of infrared drying. Rev. papiers et cartons 17, no. 12: 19-20 (June 15, 1954). [In French]

Possible applications of infrared drying in the paper, board, and printing industries are discussed very briefly. 2 illustrations. E.S.

HISTORY

SPORHAN-KREMPEL, LORE. The paper mill in Ulm. Wochbl. Papierfabrik. 82, no. 11: 467-9 (June 15, 1954). [In German]

The history of the first paper mill in Ulm, built by Christoph Neuhaus around 1641, the fate of the mill and its later owners, and the watermarks used by some of them (all employing the heraldic shield of the city) are described. 3 figures and 16 references. E.S.

VAULTIER, ROGER. History of articles designed for erasing and drying ink. Papetier 8, no. 5: 66-8 (May, 1954). [In French]

The author traces the development of erasers from scraping instruments for animal parchment (the expensive skins frequently being used several times, so-called palimpsests), erasing knives, and rubber erasers to chemical eradicators, and of driers from sandarac resin and different powders, including sawdust and fine (frequently brightly colored) sand to high-grade blotting papers. Implements for using the drying agents (containers and small ivory or ebony shovels for collecting the used material) are also listed. 2 illustrations. E.S.

HYDROGEN PEROXIDE

SATTERFIELD, CHARLES N. Hydrogen peroxide. Chem. Eng. News 32, no. 27: 2726-30 (July 5, 1954).

The output of hydrogen peroxide (I) has tripled in the past eight years, and expansion for 1955 will double the 1950 capacity in the United States. The past, present, and future positions of (I) are discussed, with particular reference to manufacturing processes and applications. The principal consumption is as an oxidizer, particularly in bleaching textiles and wood pulp. The future use of (I) will depend on the market price which, in turn, is dependent upon the cost of manufacture and the marketing policies of the major producers. 3 figures and 1 map. E.S.

INORGANIC PAPER

ANON. Glass fibers for the manufacture of paper. Svensk Papperstidn. 57, no. 11: 417-18 (June 15, 1954). [In Swedish]

Paper made from either spun glass or chopped fiber-glass textile strands has passed the laboratory stage and will soon assume increasing importance in industrial applications, either alone or in blends with other fibers. The properties of glass fibers and deviations from standard papermaking in the manufacture of glass-fiber paper (I) are described. The advantages of (I) include high thermal and chemical stability, noncombustibility, wet strength, dimensional stability under varying atmospheric conditions, resistance to corrosion, possibility for sterilizing, etc. Inorganic and organic binding agents may be incorporated, depending upon use requirements. 1 illustration. E.S.

ARLEDTER, HANNS F. Uses of inorganic synthetic fiber paper. Tappi 37, no. 7: 152-6A; discussion: 156-7A (July, 1954).

In the form of a progress report the author discusses developments by the Hurlbut Paper Co. in the field of inorganic absorbent papers for the laminating industry, especially for polyester, epoxy, melamine, and phenolic resin applications. Problems in the manufacture of such papers and in their application to the manufacture of laminates are mentioned. The scope of different possibilities is outlined, although much work still remains to be done. Inorganic papers will be available in the near future in a variety of thicknesses, absorbency, and density, and containing filler or colors, and other properties. Papers from combinations of inorganic and organic synthetic or papermaking fibers are in the pilot-plant stage. 13 tables. E.S.

INSTRUMENTATION

BEARD, CHESTER S. What is new in pulp and paper control instruments? Paper Trade J. 138, no. 29: 14-16, 18 (July 16, 1954).

Recent developments in the line of instrumentation in the pulp and paper industry are discussed, including pneumatic transmitters, flow tubes, monitoring equipment, ratio-flow control, displacement meters with electric transmitters, power-control valves, graphic panel boards, and instruments for measuring the intensity of dust and solids in a gas stream. 3 figures.
R.A.S.

DIXON, W. E., JR. Rotary kiln instrumentation. Ind. Eng. Chem. 46, no. 7: 1436-41 (July, 1954).

The author describes in detail the application of equipment for measuring or controlling specific variables relating to efficient kiln operation. An integrated system for control of these interrelated variables is proposed. This system includes control of the air to fuel ratio by a method based on the measurement of the oxygen in the exhaust gases. A description of the instrumentation of auxiliary equipment, such as clinker coolers and precipitators, is also included. Practical solutions to operating problems in individual situations may be found through the proper application of instrumentation. 13 figures and 4 references. E.S.

INSULATION AND INSULATING MATERIALS

WADE, CHAS. F. Heat losses and insulation. Paper-Maker (London) 127: 46, 48 (Mid-summer, 1954).

The author discusses heat losses from boilers, piping, and other hot surfaces, particularly in medium- and small-sized plants; the principle of high-efficiency laggings based on the nonconductivity of still gases (air) which they entrap in large amounts; and types of insulating material (plastic compositions and nonplastic coverings) and their correct applications. E.S.

INTERIOR PACKING

ANON. Engineered shipper. Modern Packaging 27, no. 11: 123 (July, 1954).

Sizable savings in box costs, freight charges, storage expense, and manhours and assured protection were realized by the Dictaphone Corp., Bridgeport, Conn. with the use of a self-contained corrugated folder with a die-cut handle, interior packing pieces, a double sleeve containing accessory items which serves as a cushion, and a corrugated shipping container for efficiently packaging dictating and transcribing machinery. 2 illustrations.
R.A.S.

JUTE

MUKHERJEE, S. M. Mercerisation in acid-treated jute fibre. J. Textile Inst. 45, no. 5: T405-11 (May, 1954); *cf.* B.I.P.C. 21: 400.

The author studied the process of mercerization in jute pretreated with progressively increasing concentrations of sulfuric acid. A gradual increase in the hydrate transformation with an increase in concentration of the acid was observed and is ascribed to a reduction of the restrictive strains imposed by the presence of lignin; fibers pretreated in 500 grams/liter of sulfuric acid showed more or less complete transformation, probably because at this stage the degree of breakdown of the cellulose chains and linkages

just counteracts the restraints imposed by the lignin. He also examined the hydrate transformation in jute and ramie when washed after treatment in 65% nitric acid, i.e., the concentration known to produce the Knecht compound (addition compound between cellulose and nitric acid). Jute shows a more or less complete transformation to the hydrate under these conditions, whereas it is only partial with ramie. The greater separation of the chains in the noncrystalline regions resulting from the presence of lignin in jute (which is supposed to be one of the reasons for the poor crystallinity of the fiber) is assumed to facilitate penetration by the swelling agent, so that transformation is more complete than in the case of a more organized fiber like ramie. Similar results as with raw jute were observed with Cross and Bevan cellulose from jute. The author draws the conclusion from the results of his studies that the degree of hydrate transformation in raw jute is directly correlated with the imperfection of crystallinity and inversely correlated to the restraining force imparted by lignin which, when removed either by delignification or chemical modification, allows more complete penetration of the swelling agent. 6 figures and 12 references. E.S.

KRAFT PULP AND PAPER

STREET, J. R. W. Merchants' role vital in selling of converted kraft, SAPI told. Paper & Paper Products 96, no. 1: 1, 13, 16-17 (July 5, 1954); Paper & Twine J. 28, no. 5: 33-5 (July, 1954).

The author summarizes data on the production of kraft paper in 1953, stating that wrapping paper accounted for only ⅙ of the total production and ⅔ of this wrapping paper was used by manufacturers as an industrial wrap, whereas bags (exclusive of multiwall shipping sacks) represented a little more than ⅓ of the total production. Nearly all kraft paper goes through some form of conversion; paper merchants play a major role in the sale of converted products of kraft paper. The business picture for the industry is viewed as a continuation of the growth trend, but at a slower rate. R.A.S.

LIGNIN

PHILLIPS, E. W. J. Influence of leaf activity on the composition of the wood cell wall. Nature 174, no. 4419: 85-6 (July 10, 1954).

Clarke (*cf.* Nature 135: 910 [1935]) discovered that the phloroglucin-hydrochloric acid stain revealed a relationship between fiber-wall composition and strength of British ash (*Fraxinus excelsior*); later experiments with other hardwoods demonstrated the applicability of this relationship and brought to light a marked difference between temperate and tropical species. The present author presents evidence that the controlling factor in lignification (in the botanical sense) of the fiber wall is the illumination received by the leaves. In English ash, the springwood zone (which is formed before the leaves have expanded) of each annual ring consistently gave a poor lignin reaction irrespective of the degree of lignification in the remainder of the ring. The greater lignification of tropical timbers is attributed to the exposure to more adequate solar illumination in the tropics. 1 figure and 3 references. E.S.

SEMECHKINA (SEMEČKINA), A. F., and SHORYGINA (ŠORYGINA), N. N., with an introduction by WITTWER, R. Action of metallic sodium in liquid ammonia on sprucewood. Faserforsch. u. Textiltech. 5, no. 2: 79-81 (February, 1954). [In German] *cf.*

Zhur. Obshchei Khim. 23: 593-5 (1953); C.A. 47, no. 20: 10843 (Oct. 25, 1953).

Sprucewood (30-50 grams), when treated with sodium in liquid ammonia at —33°C., gave rise to 34.4% cellulose, 8.3% hemicelluloses, 9.2% lignin, and various lignin and carbohydrate degradation products (7.5% soluble in ether and 12.3% soluble in water); about 28% remained unaccounted for. A part of the methoxyl content is retained by the carbohydrates of the wood. An important degradation product of the lignin was dihydroeugenol. Whatever lignin was recovered still retained 15.36% methoxyl. The significance of the work is discussed briefly. 4 references. L.E.W.

LIME AND LIMESTONE

ANON. S. D. Warren improves lime handling at Cumberland Mills. Paper Ind. 36, no. 4: 365-6 (July, 1954).

Recent plant modernization at the Cumberland Mills, Maine of S. D. Warren Co. consisted of the complete replacement of the soda mill's pulp washing, screening, and bleaching facilities; the expansion of capacity for filtering process water; and the addition of an oil-fired rotary lime kiln to the causticizing cycle. Details of the kiln construction are given. 4 illustrations. R.A.S.

MURRAY, JAMES A., FISCHER, HERMAN C., and ROLNICK, LEONARD S. Shrinkage of high-calcium limestones during burning. J. Am. Ceram. Soc. 37, no. 7: 323-8 (July, 1954).

The shrinkage characteristics of 43 commercial high-calcium limestones, calcined at four different temperatures above the dissociation temperature, were studied by means of bulk-density measurements of the stones and their respective calcines. Chemical, spectrographic, and petrographic analyses could not be correlated with the shrinkage data. 4 tables. E.S.

LOADING AND UNLOADING—CARS

RODES, T. W. Reinforced moistureproof paper protects materials in transit and in storage. Ind. Eng. Chem. 46, no. 7: 101-2A, 104A (July, 1954).

The retaining paper method of unitized loading of fiberboard shipping containers on railroad cars is described. The composition of a typical retaining paper is two layers of high-quality, long-fibered 30-lb. kraft, two layers of asphalt, and two layers of reinforcing fibers running lengthwise and crosswise, embedded in the asphalt. The paper covers the car floor and end wall, is wrapped across the top of the two end blocks of containers, over half of the next two blocks, and then across the floor again; the other end of the car is similarly packed tightly in place. 4 figures and 2 references. R.A.S.

LUBRICATION AND LUBRICANTS

CLARK, R. W., FULLER, J. H., and GLEBER, J. A. Lubrication. Chem. Eng. 61, no. 7: 211-28 (July, 1954).

With particular reference to the many unique problems encountered in the lubrication of chemical equipment, the authors review lubricants available to the industry; applications to different types of bearings, gears, drive chains, and sliding surfaces; and the need for a lubrication schedule. 10 tables and 23 figures. E.S.

MACHINERY

DON, G. STUART. U.K. seeks increased sales of paper mill machinery to Canada. Pulp Paper Mag. Can. 55, no. 7: 110-11 (June, 1954).

The author points out the merits in quality and design of British-made papermill machinery and improvements in problems of delivery and service for the purpose of encouraging the purchase of British machinery by the Canadian paper industry. 2 tables. R.A.S.

MACHINERY—BELTING

MATHEIS, A. F. How to get highest performance and wear from elevator conveyor belts. Paper Trade J. 138, no. 27: 21-2, 24-5 (July 2, 1954).

The elevator conveyor belt with metal buckets offers greatly increased flexibility in solving bulk materials-handling problems. The performance of the belt depends on proper allowance of interdependent factors, such as material to be conveyed, height, bucket spacing, and belt speed. A few simple rules are listed for selection, installation, splicing (clamp, lap, butt-strap, and plate joints, alignment, loading, tension, safety devices, and pulley lagging), and maintenance and repair (regular inspection, immediate repair of damage, repair kit, and vulcanized patches). 2 tables and 6 figures. R.A.S.

MACHINERY—BOARD MACHINES

HAYES, FRANK, and LOEBER, F. CARLTON. The forming machine on monolithic sheet production. Tappi 37, no. 7: 164-6A; discussion: 166A (July, 1954).

Reference is made to the machine invented by Alvan D. Simpson (U. S. patent 2,581,210 [Jan. 1, 1952] *cf.* B.I.P.C. 22: 457); its operating principle (continuous sheet formation and water removal by the application of compressed air) is described, and the possibilities for adding powdered resins to the furnish are discussed. Asbestos, glass fibers, combinations of the two, and mixtures with different types of paper fibers have been used successfully in pilot-plant experiments. 2 figures. E.S.

MACHINERY—CHIPPERS

AREND, J. L., SMITH, R. N., and RALSTON, R. A. Tests of a portable wood chipper in utilizing logging residue and in disposing of brush. U. S. Dept. Agr. Forest Service. Lake States Forest Expt. Sta. Paper no. 30: 37 p. (January, 1954).

To investigate the possibilities of portable wood chippers in the field of forest management, a co-operative study, consisting of a series of performance tests utilizing logging residue from pulpwood operations as well as roadside brush, was made in Lower Michigan during 1953. Chipping performance tests were made, using oak-, aspen-, and pinewood, to determine production rates, operational costs, general adaptability, and portability of the chipper for slash and brush disposal and utilization operations. The wood material was separated by random lengths into three general top diameter classes—0-1, 1-4, and 4-6 inch. Two variations of the same model portable chipper, differing mainly in number of knives, cutting speed, and size of feeding hopper were used. The first machine had eight cutting knives operating at a

cutting speed of 1500 r.p.m. The modified model had 12 cutting knives operating at a cutting speed of 2200 r.p.m. A 31-horsepower motor was used on both models. It is concluded that the low production costs relative to standard pulpwood should make it possible to market chips from sticks 1-4 inches in diameter which are currently being left in the woods on most pulpwood operations, if the objectionable features of lack of uniformity, high proportion of bark and leaves, mixture of species, and uncertainty of supply can be minimized. 8 tables, 11 figures, and 8 references. E.S.

EDWARDES, VANCE P. Chipper operation. Tappi 37, no. 7: 300-2 (July, 1954).

Chipper operation and maintenance are very important factors in the production of sawdust and chip uniformity. On four-knife chippers, sawdust varies directly with the speed, the percentage of chips of the desired size increases with decreasing speed, power per cord varies directly with the speed, and paper strength increases with decreased speed. On four- or multiple-knife chippers, knife sharpness has a marked effect on sawdust and power. Chipper condition has an important bearing on sawdust and chip quality. Using the chipper to capacity reduces the amount of sawdust and increases the chip uniformity. Knives should be changed rather than filed. The bedplate should be kept sharp and in close adjustment to the knives. 1 table and 4 figures. E.S.

MACHINERY—CONVERTING MACHINERY

ACHARD-PICARD, REMY & CIE. Impregnating machinery. Rev. papiers et cartons 17, no. 8: 21, 23, 25-6 (April 15, 1954). [In French]

This is essentially a condensed translation from different articles by F. W. Egan on coating and impregnating machinery and winders presented by the French licensee of Frank W. Egan & Co., Bound Brook, N.J. 11 figures. E.S.

ANON. Construction problems and general characteristics of new boxmaking machinery. Allgem. Papier-Rundschau no. 11: 581-4 (June 5, 1954). [In German]

The general trends in modern boxmaking machinery (compact expedient construction, use of wear-resistant materials, and higher efficiency and output with identical space requirements) are illustrated in five models built by the German firm Kerma, Brüggen-Niederrhein, including a paper jogger, a box stitcher, a finger-hole punch for foot action, and two heavy constructions of cutting and creasing platen presses with electric drive. 3 tables and 5 illustrations. E.S.

MACHINERY—CUTTERS

DER MASCHINENSCHADEN. Experience with shear pins on rag cutters and beaters. Wochbl. Papierfabrik. 82, no. 7: 217-19 (April 15, 1954). [In German]

During a period of about 20 years, 36 cases of machine damage were recorded on two rag cutters with frequent and considerable losses in production in addition to costly repairs; 65% of these accidents could be traced to the presence of tramp iron introduced with the rags. The installation of shear pins (which can be exchanged rapidly when broken) on the driving pulleys and slight changes in the drive construction now prevent damage to

the machinery proper and costly shutdowns of operations when tramp iron is accidentally introduced. Shear pins may also be used in a similar manner on beaters. 4 figures and 1 reference. E.S.

MACHINERY—ELECTRIC EQUIPMENT

BUTLER, J., and LINDBERG, R. W. Application of air circuit breakers 15,000 volts and below. Pulp Paper Mag. Can. 55, no. 7: 115-26 (June, 1954).

The authors describe the mechanical features, principles of arc interruption, and application of air-circuit breakers up to 15,000 volts. For ease of presentation the paper is divided into two parts, Part I: 2500 to 15,000 volts and Part II: 600 volts and below. The magnetic-blast principle of arc control for medium-voltage breakers and the multislot principle of arc extinction for the low-voltage breaker, plus effective utilization of space, have produced a line of air-circuit breakers with short-time and close-and-latch ability equal to their interrupting ratings, requirements necessitated by the rapid growth of the electrical industry over the past 10 years. As a result there is available to the industry a line of medium-voltage breakers with operating characteristics equal and in some cases superior to oil-circuit breakers, along with a complete line of low-voltage air-circuit breakers ideally suited to the multiple requirements of selective, cascade, and general applications of present-day electrical systems. 2 tables, 22 figures, and 6 references. E.S.

HOBBS, G. P., and KAUFMANN, R. H. Electrical system grounding. Tappi 37, no. 7: 116-17A (July, 1954).

The author discusses the causes of premature electrical breakdowns created by overvoltages (I), the reasons for the development of dangerous (I), and effective grounding of the electrical distribution system for eliminating (I) problems. 3 figures. E.S.

MACHINERY—FELTS

HEDBERG, HAROLD F. Felt research contributes to increased productivity in paper mills. Paper Ind. 36, no. 4: 378-9 (July, 1954).

The author discusses the accomplishments which have resulted from felt research activities—applications to combat adverse chemical conditions in the paper stock, bactericidal treatments, treatments to ensure a longer felt life, the use of nylon in paper-machine felts, and the development of efficient felt-cleaning methods. R.A.S.

MACHINERY—PACKAGING MACHINERY

ANON. Cushion-lined lock-tabs. Modern Packaging 27, no. 11: 144-5, 148-9 (July, 1954).

A recently developed machine, installed at the Burbank, Calif. plant of the Weston Biscuit Co. for packaging cookies, automatically sets up the cartons, which have a locking-tab corner closure; lines them precisely with a greaseproof corrugated glassine cushion liner, with a partition for two rows of cookies; and delivers them to the packaging line, ready to fill. A printed aluminum foil overwrap seals the package. 6 illustrations. R.A.S.

MACHINERY—PAPER MACHINE

ANON. A new fine paper machine at Tervakoski Osakehtiö.

Paper and Timber (Finland) 36, no. 5: 246 (May, 1954); Finnish Paper and Timber 5, no. 3: 28 (1954). [In Swedish and English; second reference abridgment]

The eighth paper machine for Tervakoski paper mill built by A. Ahlström Oy Karhula Bruk in Finland for the manufacture of electrical-insulating, carbon, and thin printing (Bible) papers is described briefly. Depending on grade, the machine's daily capacity amounts to 5-30 tons. 1 illustration in the first and 2 in the second reference. E.S.

ANON. Rebuild project completes Fort Frances machine modernization. Paper Ind. 36, no. 4: 363-4 (July, 1954).

The complete remodeling of the No. 7 paper machine at the Fort Frances, Ont. mill of Minnesota & Ontario Paper Co. is described; the project included raising the headbox and Fourdrinier wire 18 inches and installing a 44-inch diameter double-box couch roll. The rebuilt unit is expected to add about 10,000 annual tons to the mill's production. 9 illustrations. R.A.S.

SCHMIDT, KARL. Fourdrinier paper machines—present status and trends. Wochbl. Papierfabrik. 82, no. 11: 426-37; no. 12: 505-9 (June 15, 30, 1954). [In German] *cf.* B.I.P.C. 23: 643.

Continuing his discussion of requirements of high-speed Fourdrinier machines and trends in construction, the author reviews recent developments in pulp metering and regulation, flow of stock onto wire, sheet formation (pressure and vacuum formation), table rolls, suction couch, vacuum web transfer, drier part, size press, machine-coating equipment, winders, and drives. Voith equipment figures prominently but not exclusively in the descriptions. 52 figures and 9 footnotes. E.S.

MACHINERY—PASTING MACHINE

ERNICKE, H. D. Automatic application of adhesives with OPI-A/54 increases efficiency and lowers costs. Allgem. Papier-Rundschau no. 10: 534-6 (May 20, 1954). [In German]

An adhesive-applying machine for converting machinery developed by the Planatolwerke W. Hesselmann in Germany which replaces dipping procedures and its advantages are described. The device consists of a cylindrical adhesive container which may be hung outside the machine, if desired, from which through slight pneumatic pressure the narrow applicator proper is provided with the required amount of adhesive; the width of application is adjustable. Since the entire equipment is airtight, no daily cleaning is required, unless a change in adhesive is made. 1 illustration. E.S.

MACHINERY—PRINTING MACHINE

ANON. High-speed rotary printing. Boxboard Containers 72, no. 739: 18-21 (July, 1954).

A new Miehle three-color, sheet-fed, rotary letterpress installed by Ace Carton Corp., Chicago provides an increase in production, improved operating efficiency, and higher quality of product. The top operating speed of 6000 impressions/hour on 19- to 30-point boards triples the letterpress production of an older flat-bed press. Two Yannke sprays to prevent sticking on delivery, a system of boxing to prevent color offset when using gloss inks, and a Dexter stream-feed delivery system are additional aids to efficient operation. 10 illustrations. R.A.S.

ANON. "Printall 20" aniline printing machine. Paper Box Bag Maker: 284, 286 (June, 1954).

An aniline printing machine for specific batch jobs and overprinting of additional matter, the Printall No. 20, is described; the machine will print materials up to 0.5 inch in thickness, finished cartons and boxes in unerected form, and uneven materials such as along a bag seam. The machine can be operated by unskilled labor. 1 illustration. R.A.S.

MACHINERY—PULPERS

LEWIS, R. B. Newark Boxboard adds new Fibrepulper. Paper Mill News 77, no. 29: 4 (July 17, 1954).

The continuous-type Downingtown 4C1 FIBREpulper recently put into operation at Newark Boxboard Co., Newark, N.J. is described; 100 tons of mixed paper are pulped in 24 hours of operation. The Downingtown hydraulic control system prevents damage from jamming or stalling by reversing the pulper. 4 illustrations. R.A.S.

MACHINERY—PUMPS

MILLER, R. A. How much can a pump pump? Paper Trade J. 138, no. 28: 24, 26 (July 9, 1954).

Allis-Chalmers introduced a new designation "limiting entering head" (LEH) for expressing the limitation of a pump's capacity or volume. In every pumping problem there are two LEH considerations: the required LEH of the pump and the available LEH of the installation site. Formulas for calculating the two magnitudes and directions for their application are given. 5 figures. E.S.

MACHINERY—ROLLS

HAMPEL, W. New methods for the control of rolls. Das Papier 8, no. 13/14: 288-90 (July, 1954). [In German] *cf.* B.I.P.C. 24: 720.

Applications of the instrument described in the previous reference are discussed, particularly the regular control of the crowning of all rolls in the paper machine and calenders. The preparation of crowning curves as a permanent record for the most suitable crowning of rolls is recommended; an example is included. 3 figures. E.S.

MACHINERY—SCREENS

GARDNER, W. S., SMITH, E. H., and BROWN, C. L. Performance of Cowan screens on kraft pulp at Crossett Paper Mills. Tappi 37, no. 7: 314-16 (July, 1954).

Early experience with Cowan screens on kraft pulp at the Crossett Paper Mills was not satisfactory. The capacity of screens was low and water and power usage was high compared with predicted results and those obtained in other southern mills on kraft pulp. Early experience at this plant was obtained with 0.085-inch perforations on 0.125-inch isometric centers (I). Later tests with 0.085-inch perforations on 0.219-inch isometric centers (II) indicated a capacity only slightly below that obtained with 0.085-inch perforations on (I). This change in spacing of perforations gave a tremendous reduction in total number of perforations in a set of plates. A set of Cowan plates with perforations on (I) contains approximately 300,000

perforations, whereas the same plates with perforations on (II) contain approximately 100,000 perforations. Further tests were made with 0.085-inch perforations on 0.1445-inch isometric centers. Immediate results showed greatly improved performance. It was possible to operate the screen at predicted capacity with lower water and power usage than had been necessary for highest tonnage obtained in tests with other plates. 2 figures. E.S.

SCHENK, H. F. Selective particle separation by controlled fluid forces on a flat screen. Tappi 37, no. 7: 283-6 (July, 1954).

The construction and operation of flat screens to obtain maximum screening efficiency and dirt removal are described. E.S.

MACHINERY—WIRES

HANATSCHEK, ERHART. Drainage conditions of paper machine wires. Das Papier 8, no. 13/14: 268-74 (July, 1954). [In German; English and French summaries]

The projected open space of paper-machine wires is traditionally considered the criterion for their permeability. The inadequacy of this concept is shown by a comparison of plain-weave and twill-weave wires. The author recommends the determination of the effective open space of the wires and the combination of this value with the flow coefficient (which depends on the clear space between the meshes) to a drainage coefficient which should be used as the criterion for the permeability of paper-machine wires. 14 figures and 2 references. E.S.

MERCERIZATION PROCESS

SCHURZ, JOSEF. Adsorption processes taking place during the steeping of pulp. Svensk Papperstidn. 57, no. 11: 399-404 (June 15, 1954). [In German; English summary]

The adsorption of glucose and hemicellulose in sodium hydroxide solution on charcoal obeys Freundlich's law. When cotton-linters pulp (I) is steeped into mercerizing liquor, a negative adsorption takes place, i.e., the hemicellulose content of the liquor increases. This increase is larger than can be accounted for by the removable hemicellulose in (I) and is higher, the higher the hemicellulose concentration of the steeping liquor. This phenomenon is explained by the penetration of the sodium hydroxide and water of the liquor containing hemicellulose into the cellulose fibers in a dialyzing manner whereby the fibers swell. This results in a removal of solvent from the steeping liquor surrounding the swollen fibers and an increase in its hemicellulose concentration. The author concludes that hemicellulose present in the steeping liquor is not adsorbed by cellulose. In spite of this fact, residual hemicellulose in the pulp remaining after incomplete pressing may still be present in a sufficient amount to exert a deteriorating influence on the quality of the spun viscose thread. Any quantity higher than 1% of hemicellulose in the steeping liquor may be considered harmful in general. The influence of the hemicellulose on yarn quality, especially its elastic properties and wet strength, is not yet quite clear. It will differ according to its nature; at least a differentiation between hemicellulose derived from the same pulp and that present from previous steepings will have to be made. 2 tables, 2 diagrams, and 28 references. E.S.

METERS AND RECORDERS

STENTZ, E. L., and BERGER, R. C. Paper tension regulators.

Paper Mill News 77, no. 27: 106 (July 3, 1954). [Abridgment] *cf.* B.I.P.C. 24: 556.

This is essentially the same article as the one previously published under the names of G. C. Ehemann and R. C. Berger. E.S.

WALTER, LEO. Fundamentals of automatic rate of flow control. Paper Ind. 36, no. 4: 380-2 (July, 1954).

A description is given of the use of the Foxboro Co. D/P cell and the Dynalog recorder and controller, using electronic magnification of measuring and control impulses, for the automatic control of rate of flow. 10 figures. R.A.S.

MILL CONTROL

ELLIOTT, NORMAN J. Production planning and control. Chapter 7—A system for corrugated container manufacturers. Boxboard Containers 72, no. 739: 28-31 (July, 1954); *cf.* B.I.P.C. 24: 900.

Production-control procedures are discussed as applied to the manufacture of corrugated shipping containers. Elements for the control plan are a review of the orders for delivery-date possibilities, the laying out of a daily schedule of equipment, the sending of work orders through the plant, and careful materials handling to serve the needs of the next process required. 4 production-control forms and 1 illustration. R.A.S.

TICE, HARRY S. Double Envelope installs a cost control program. Paper, Film and Foil Converter 28, no. 7: 26-30, 58 (July, 1954).

The program set up by Double Envelope Corp., Roanoke, Va. for controlling costs is described. Steps in the analysis portion of the program were the inauguration of standard-hour wage incentives and the examination of the application of factory-order and manufacturing-schedule procedures, raw-material and finished-stock inventories, and sales policies. Cost centers were then described and limited and work sheets set up. Controls devised to hold the cost program at its highest achievement level were applied in phases of labor, supervision, purchasing, inventories, manufacturing potentials, quality of product, sales, and pricing. 1 table and 3 illustrations. R.A.S.

MILL MANAGEMENT

FAIR, A. E. H. Men, machines and management. Paper Mill News 77, no. 27: 87-8, 90 (July 3, 1954); Paper Trade J. 138, no. 26: 60, 62, 64 (June 25, 1954).

With progressive mechanization in industry and the need for more production to support the country's economy, responsibilities are faced, the importance of which is not generally appreciated. These responsibilities are not restricted to management alone, but must be shared by labor as well; they call for mutual understanding and leadership of the highest order. The future of industry depends upon the general acception of the fact that production must precede possession. Management needs the help of every employee to increase man-hour production and to improve quality; the willing support of labor is a vital necessity. More employee interest can be developed by management through making facts available which, with the support of labor organizations, should bring about the necessary co-operation to preserve and improve present standards. E.S.

SCHWEISHEIMER, W. Weather conditions influence production. Paper Ind. 36, no. 4: 392 (July, 1954).

The author discusses the effect of atmospheric conditions such as weather, barometric pressure, air electricity, radioactivity of the air, and sunspots on the working capacity of the individual. R.A.S.

TICE, LAWRENCE W. Practical personnel relations. Paper Mill News 77, no. 27: 101-2, 104 (July 3, 1954).

The results which a company gets in return for its efforts and expenditures depend largely on the manner in which it plans and administers not only management problems, but its personnel-relations program as well. Directions for developing a successful program of this kind are given, including the recognition of the essential dignity of man, appreciation by the respective bosses and fellow workers, a chance to be heard, job security, fair treatment, a feeling of confidence in management, and pride of the workers in their jobs and in the company. In conclusion, the benefits to be derived from company training programs are discussed. E.S.

MOLDS

ANON. Safer shipping for fruit. Chem. Week 75, no. 2: 54, 56 (July 10, 1954).

Reference is made to a new antifungal citrus-treatment method developed by E. Hopkins and K. Loucks of the Florida Citrus Commission, which consists of a two-minute bath of the fruit in a solution containing 2% Dowcide A (sodium *o*-phenylphenate) (I) and 1% hexamine (hexamethylene tetramine), followed by a plain water rinse. Decay is claimed to be cut to half or one third of that of untreated fruit. (I) is also the key ingredient of Stop-Mold B, a fungicidal preparation developed for the protection of apples and pears in the Northwest. 1 illustration. E.S.

MUCILAGE

WHISTLER, ROY L., and CONRAD, H. E. 2-*O*-(D-galactopyranosyluronic acid)-L-rhamnose from okra mucilage. J. Am. Chem. Soc. 76, no. 13: 3544-6 (July 5, 1954); *cf.* B.I.P.C. 24: 634.

Okra mucilage on partial acid hydrolysis yields a mixture of oligosaccharides which can be separated by chromatography on carbon and cellulose columns. Among the acidic oligosaccharides, there are an aldobiouronic acid and two aldotriouronic acids. By the methylation method the first of these is shown to be 2-*O*-(D-galactopyranosyluronic acid)-L-rhamnose. The aldotriouronic acids are shown to be galactosyl → (galactosyluronic acid) → rhamnose and a (galactosyluronic acid) → rhamnosyl → galactose. The occurrence of these oligosaccharides as hydrolytic fragments of okra mucilage suggests that the linkages involved are present in the polysaccharide. 1 table and 10 footnotes. E.S.

NETTLES

BREDEMANN, G. The cultivation of bast fiber plants with high fiber content. Faserforsch. u. Textiltech. 4, no. 1: 33-6 (January, 1953). [In German]

Through planned cultivation over a period of 30 years, the author has succeeded in increasing the fiber content of the wild nettle *Urtica dioica* L.

from 4-5 to 13%, and later even to 15% simultaneously with an increase of the size of the plant. A similar result was obtained with the hemp *Cannabis sativa* L. within 17 years. 2 tables and 3 references. F.E.B.

NEWSPRINT

SAVAGE, J. M. Canadian newsprint appraisal. Paper Mill News 77, no. 27: 107-8, 110 (July 3, 1954).

The author discusses the postwar expansion of the Canadian newsprint industry which has been principally achieved by the improvement and enlargement of existing mills. The current position and prospects of Canadian newsprint manufacturers look good, with mills running practically at capacity, although high and rising costs are causing some anxiety. The long postwar period of newsprint shortage is apparently over. The increase of total tonnage is still going on, but local and export demand are keeping up with almost total production. The time when additional capacity will be needed naturally depends on demand. In conclusion, a relatively new development, the vacuum pickup for couch suction transfer installed on at least five Canadian newsprint machines, and its beneficial effects (less chemical pulp required in the furnish, higher machine speeds, and fewer breaks) on quality and output are briefly mentioned. E.S.

OXIDATION-REDUCTION

EDELMANN, KURT. The measurement of the redox potentials. Faserforsch. u. Textiltech. 4, no. 8: 337-42 (August, 1953). [In German]

Following a definition and discussion of the theory of the oxidation-reduction potential (ORP) and rH and their importance in the field of macromolecular chemistry, various instruments for the determination of ORP and for following the changes of ORP during a chemical reaction are described. 2 tables, 4 figures, and 9 references. F.E.B.

PACKAGING

ANON. Charcoal grilling made easy. Modern Packaging 27, no. 11: 128-30, 240-1 (July, 1954).

The Reynolds Metals Co., Louisville, Ky. packages its complete grill kit, including charcoal in a foil-covered carton, a granular starter fuel in a foil-laminated, fin-sealed pouch, a 25-foot roll of aluminum foil, a small folding aluminum grill, tongs, and an instruction folder, in a carry-handle corrugated carton. 7 illustrations. R.A.S.

ANON. Considerations of shelf display. Modern Packaging 27, no. 11: 87-93, 238, 240 (July, 1954).

The importance of considering shelf stacking at the point of retail in the packaging of products is emphasized. Suggestions are given, such as printing brand names on the end and side panels, printing the design vertically on one and horizontally on the other face, and in the case of paper cups stacked upside down, to comply with the stackers. A checklist of 11 basic requirements of good package display is included. 17 illustrations and 8 references. R.A.S.

ANON. Drill lubricants packaged in fibre cups. Packaging Parade 22, no. 258: 55 (July, 1954).

Fiber cups covered with fiber lids are being used to package dry drill lubricants manufactured by Aviation Lubricants Co., San Diego, Calif. The lubricant can be applied by pushing the drill, while operating, through the fiber lid; as the bit is pulled out, excess lubricant is wiped off onto the sides of the hole made in the lid. 2 illustrations. R.A.S.

ANON. Frozen foods. Modern Packaging 27, no. 11: 102-7, 224, 226 (July, 1954).

The growth of the frozen-foods industry is reviewed; the industry has expanded from the experiment with packaging frozen fish pioneered by Clarence Birdseye 25 years ago to an industry with an output by some 1400 companies of 3.4 billion pounds in 1953 and an expected production of 4.5 billion pounds in 1954. An especially bright future is seen for frozen baked goods; it is predicted that within three to five years, nearly 75% of all bread will be frozen. Standard styles of the waxed sulfite folding carton, used almost exclusively for frozen vegetables, fish, and other products, are described. 19 illustrations and 7 references. R.A.S.

ANON. Lemon juice by the ounce. Modern Packaging 27, no. 11: 142-3 (July, 1954).

A flexible film pouch, a lamination of cellophane and polyethylene films, holds one ounce of frozen lemon juice produced by Sunkist Growers, Los Angeles. Eight pouches are packed in a waxed paperboard carton. 3 illustrations. R.A.S.

ANON. Mechanized lines for packaging bearings. Packaging Parade 22, no. 258: 48-9, 69 (July, 1954).

The West Pullman Works of International Harvester Co., Chicago utilizes three packaging lines which turn out wrapped packages of bearings. The bearings travel on a conveyor, pass through a solution of Nox-Rust corrosion preventive, and are picked up on a metal rod to be wrapped in a double thickness of protective paper or individually with a metal pick to be packaged in a service-part container. 8 illustrations. R.A.S.

ANON. New casing for skinless franks offers more product uniformity. Packaging Parade 22, no. 258: 56-7 (July, 1954).

A shirred cellulose casing for frankfurters, Wienie-Pak "Smoothies" developed by Transparent Package Co., Chicago, is reported to make possible an increased degree of uniformity in the processing of skinless frankfurters. The design of the "caddy" package and a tear-strip corrugated shipping container are simultaneous improvements in packaging the product. 3 illustrations. R.A.S.

ANON. Pie for a dime. Modern Packaging 27, no. 11: 114-15 (July, 1954).

A cellophane-topped tray with triangular corners for 10-cent pies has resulted in a savings of 25% in packaging-material costs for Mrs. Smith's Pie Co., Pottstown, Pa. 6 illustrations. R.A.S.

ANON. Pop it in the package. Modern Packaging 27, no. 11: 94-6 (July, 1954); Packaging Parade 22, no. 258: 47 (July, 1954).

A self-contained popcorn popper, loaded with corn and ready to use, is being marketed by Top Pop Products Company, Inc., Detroit. The popper consists

of an aluminum foil pan, a thin expandable aluminum foil cover, and a boxboard disk which folds back into a handle. The two references are not identical. 4 illustrations. R.A.S.

PACKAGING—OPENERS

ANON. Threader-sealer gives cellophane bags new 'zip.' Packaging Parade 22, no. 258: 84, 86-7 (July, 1954).

Winslow Potato Chip Co., Marblehead, Mass. is using a new Zip-Corder machine developed by Boston Packaging Machinery Co., which feeds and snips a textile thread as the bag opening is folded and heat sealed. The cord allows a straight tear on opening so that the bag can easily be refolded; different-color thread provides a code for freshness of the product. 6 illustrations. R.A.S.

PAPER—COATED

DARBY, J. R., and BERGEN, H. S. Plasticizers—their use in paper coatings resins. Tappi 37, no. 7: 145-52A; discussion: 152A (July, 1954).

The author discusses the properties which the various plasticizers impart to the most important resins used in paper-coating operations. 7 tables, 2 figures, and 2 references. E.S.

GEESE, CHARLES F. The coated paper problem. Natl. Lithographer 61, no. 6: 29 (June, 1954).

The author requests that the paper industry investigate the limits of offset printing and then manufacture coatings to fit the process, thereby eliminating problems which occur when using letterpress machine-coated papers on an offset press. R.A.S.

PAPER—COATED (EXTRUSION-LAMINATION)

ARBIT, H. A. The polyethylene extrusion-lamination technique. Tappi 37, no. 7: 162-4A; discussion: 164A (July, 1954).

The author discusses the more important factors which affect the production of satisfactory polyethylene extrusion laminates, including resin grades, types of subcarrier or base, extrusion conditions, equipment design, and a recent development, paper postheating. 4 tables and 2 figures. E.S.

PAPER—COATED (HOT-MELT)

BOOTH, G. L. Reverse roll coating experiments with hot melt resins. Tappi 37, no. 7: 157-61A; discussion: 161-2A (July, 1954).

The article is a progress report covering recent development work with a Contracoater in the application of hot-melt coatings (temperatures ranging from 170 to 350°F.), including polyethylene-wax (both paraffin and microcrystalline waxes), polyamide resins, paraffin wax, carnauba wax, and asphalt. All work was carried out with the pilot coating machine in the converting laboratory of The Black-Clawson Co., Dilts Division, in Fulton, N.Y. for determining the suitability of machinery for handling hot-melt resins on the market. 13 figures and 8 references. E.S.

PAPER—DEFECTS

ANON. Waviness and cockling in paper. Paper-Maker (London) 127, no. 6: 453 (June, 1954).

The effects of insufficient or excessive moisture in paper and means for correct maturing and conditioning prior to printing are outlined. Paper in a single sheet will adjust itself rapidly to the atmospheric conditions of its surroundings; however, when stacked in reams under the considerable pressure of its own weight, troubles are likely to develop. E.S.

PAPER—MERCHANDISING

GOULD, HARRY. Trends in paper merchandising: fine paper. Am. Paper Merchant 51, no. 7: 19, 36, 38 (July, 1954).

Trends in recent years affecting the merchandising of fine papers are reviewed, including the tendency to broader market coverages by consolidation of merchant houses, establishment by companies of merchants' advisory committees, development of machine-coated papers and new materials for impregnating the surfaces of typical English Finish and wove offset papers, the use of double coated enamel book papers, and replacement of trade customs by "mill customs." R.A.S.

MULHOLLAND, JACK. Who says: wrapping paper can't be merchandised? Am. Paper Merchant 51, no. 7: 22-3, 40 (July, 1954).

A program to merchandise wrapping paper requires a co-operating team of merchant and manufacturer. The manufacturer's responsibility includes a definite dependable sales policy, quality product, steady dependable delivery, selective distribution, suggested resale process, a complete line, trademarked merchandise, and a merchants' advisory committee. The duties of the merchant comprise a recognition of the importance of kraft wrapping paper, an adequate well-trained sales force, warehouse facilities, and support of the manufacturer. 4 illustrations. R.A.S.

PAPER AND PULP INDUSTRY

ANSTRIN, H. The pulp and paper industry of Austria. Svensk Papperstidn. 57, no. 12: 441-3 (June 30, 1954). [In Swedish]

Statistical data on forestry resources, capacity, exports, domestic consumption, and financial assistance under the Marshall plan are given. 5 tables. E.S.

BAUMGARTEN, HOWARD. What of the paper industry in 1979? Paper Trade J. 138, no. 27: 18-20 (July 2, 1954).

The author predicts that the consumption of paper in the United States will increase 114% to a per capita consumption of about 700 pounds and a gross consumption of 66.5 million tons in 1979. Additional trends within the industry—an increase in the use of waste paper from 30-35% of the fiber used to 35-40% and an increase of 10-20% in yields on pulpwood—plus dependence on Canada for additional imports are expected to produce the large amount of paper and board products which will be required. 3 tables and 4 figures. R.A.S.

NUTTALL, ELCE P. The nation's fifth industry—its marvelous expanse and unexplored domains. Tappi 37, no. 7: 110-12A (July, 1954); World's Paper Trade Rev. 142, no. 1: 11-12, 14, 17-18, 20 (July 1, 1954).

The pulp and paper industry ranks fifth in the nation according to the Annual Survey of Manufactures for 1952; paper and board mill workers, forestry employees, and other paper and allied-products workers engaged in

converting operations, plus their dependents, bring the total of the industry's responsibility to close to 5 million persons. The responsibility of the industry for conservation of natural resources has been accomplished by forestry programs. Per capita consumption for 1953 was 392.4 pounds; the future of the industry can well be assured by the seemingly limitless number of new usages for paper, board, and related products. R.A.S.

SMALL, COLLIE. Paper: third fastest growing industry. Nation's Business 42, no. 5: 28-9 (May, 1954).

The paper industry, which ranks fifth in the United States, was exceeded by only the automobile (plus parts) and the electrical machinery industries in the averages of the stockholders' equity, figured for the five-year period, 1947-52, by the Federal Trade Commission; the average profit over the past five years was nearly 8% per dollar of sales, compared with an average return of about 6% for all manufacturing industries. In 1910 the production of paper was growing at an annual rate of 5.57%; in 1950 the growth rate was 3.47%. R.A.S.

SOURANDER, INGWALD. External events which exerted an influence on the development of the Finnish paper and pulp industry during the first decade of the Finnish Paper Engineers' Association. Paper and Timber (Finland) 36, no. 5: 242-5 (May, 1954). [In Swedish]

With reference to the political situation and events of the time, conditions in the Finnish pulp and paper industry (labor, markets, technical developments, etc.) during the period 1914-23 are reviewed. 3 tables. E.S.

STEVENSON, LOUIS T. The paper industry—1954. Tappi 37, no. 7: 14A, 16A, 18A, 20A, 22A, 24A (July, 1954).

The stability of the paper industry of the United States in periods of recession is again being demonstrated; with an over-all drop of 10% in the national production index, paper and board production has dropped only 4% from the peak of 1953, based on statistics for the first quarter of 1954. The average production is only 2% below the record 1953 average; paper production is up about 2%, newsprint up 5%, paperboard production down about 5%, and building paper and board down about 4%. The profits for paper manufacturing are expected to remain at about the same level as in 1953, whereas paperboard-manufacturing profits are expected to be lower. The recession from 1953 is judged to have leveled off, and it is predicted that the paper industry could exceed last year's over-all tonnage production. 3 tables and 10 figures. R.A.S.

PAPER AND PULP INDUSTRY—PUBLIC RELATIONS

ANON. No carpetbagging here. Chem. Week 75, no. 4: 22, 24 (July 24, 1954).

The way in which Rayonier faced some of the public-relations problems (air and water pollution, housing and school problems, newcomers to community, etc.) at Jesup, Ga., when it moved a large plant into a small southern community unaccustomed to big industry, is described. 1 illustration. E.S.

PAPER AND PULP MILLS

ANON. Bowater's Mersey Paper Mills, Ellesmere Port, Cheshire. Chemistry & Industry no. 28: 825-6 (July 10, 1954).

The history and installations of the newsprint mill with an annual capacity of 140,000 tons at Ellesmere Port on the Manchester ship canal are described very briefly. One of the later developments of the firm was the building of a multiwall sack factory a few hundred yards from the newsprint mill in 1951. 2 illustrations. E.S.

ANON. Donnacona. Tappi 37, no. 7: 98-9A (July, 1954); *cf.* B.I.P.C. 24: 905.

A description is given of the woodlands operations, the sulfite mill with a yearly capacity of 50,000 tons of unbleached sulfite, the groundwood mill with a yearly capacity of 140,000 tons, the paper mill with three machines, and the board mill producing insulating and sheathing board of the Donnacona Paper Co., Donnacona, Que. R.A.S.

ANON. How a 65 year old mill was modernized and made thoroughly competitive. Paper Trade J. 138, no. 30: 14-18, 21-2 (July 23, 1954).

The postwar program of modernization and development of the Combined Locks Paper Co., Combined Locks, Wis. is discussed. A new deinking and bleaching process, a new pulp screen, and numerous patents for machine coating have resulted from the program. Improvements and revisions in the groundwood mill, groundwood screening and bleaching, the deinking plant, the paper mill, coating equipment, and the coating-preparation plant are described. 11 illustrations. R.A.S.

ANON. St. Regis completes $5,000,000 expansion at Pensacola Kraft Center. Paper Trade J. 138, no. 30: 12 (July 23, 1954); Paper Mill News 77, no. 29: 6-8 (July 17, 1954); Paper Ind. 36, no. 5: 463-4 (August, 1954); Southern Pulp Paper Mfr. 17, no. 8: 40, 42, 44 (August, 1954).

The expansion of the St. Regis Kraft Center in Pensacola, Fla. initiated in September, 1953 consisted of four major parts—the construction of a five-stage bleach plant, increased water-supply facilities, a screen-room extension to increase screening capacity, and modernization of the No. 1 paper machine for the production of bleached Fourdrinier grades. 1 illustration in the first reference, 11 in the second and fourth, and 6 in the third. R.A.S.

MCHALE, W. L., and PORTER, C. C. The paper industry and the Southland Mill. Paper Mill News 77, no. 27: 132, 134 (July 3, 1954); Paper Trade J. 138, no. 26: 54, 56, 58 (June 25, 1954); Southern Pulp Paper Mfr. 17, no. 7: 84, 86 (July, 1954); Pulp Paper Mag. Can. 55, no. 9: 85-6 (August, 1954); *cf.* B.I.P.C. 23: 268.

A description of the pioneering work in southern newsprint, the construction of the first newsprint mill at Lufkin, Texas in the South, and the successful control of pitch from southern pines similar to those presented in previous articles is given. E.S.

PAPER CONDITIONING

LITHOGRAPHIC TECHNICAL FOUNDATION. What is "green" paper. Research Progress no. 30: 1-2 (1954); Am. Pressman 64, no. 8: 28 (July, 1954).

As far as register problems are concerned, there is no such thing as green

paper; the age of the paper has nothing to do with its ability to pick up or lose moisture. Paper should be conditioned to an R.H. of 5-8% higher than pressroom R.H. for best register. R.A.S.

PAPER SIZING

EKWALL, PER, and BRUUN, HENRIK H. Surface chemical studies of the conditions of rosin sizing. Tappi 37, no. 7: 303-6 (July, 1954).

In work conducted in collaboration with Oy Keskuslaboratorio-Centrallaboratorium Ab (The Research Institute of Finnish Pulp and Paper Industries), Helsingfors, the conditions for the reaction between aluminum ions and rosin acid, and the adsorption of aluminum ions and the adhesion of rosin acids and aluminum rosinates by cellulose fibers has been investigated. The factors influencing the reaction between aluminum ions and rosin acid monolayers have been defined by surface balance studies. The inception and completion of the reaction occur at well-defined pH values and aluminum-ion concentrations. When the reaction has gone to completion, the rosin acid in the monolayer has been transformed into a dibasic aluminum monorosinate. At higher pH values and aluminum concentrations, precipitation of aluminum hydroxide occurs, and it becomes difficult to define the conditions satisfactorily. With the aid of contact-angle measurements it has been established that the reactions between solid rosin acid and aluminum ions in solutions take place under the same conditions as when the rosin acid forms a monolayer on the surface of the solution. Only the surface layer of the solid rosin acid takes part in the reaction. The possibility of transferring a monolayer of rosin acid or of aluminum rosinate on cellophane and on unsized paper has been investigated. The changes in the wetting of the cellulose surface have been studied by contact-angle measurements. The same factors which determine the reaction between rosin acid and aluminum ions have also been found to be of importance in this process. The ability of cellulose fibers to bind aluminum ions under different conditions has been measured using a surface-balance technique specially developed for this purpose. 8 figures and 11 references. E.S.

SENGER, FRANZ. Particle size of free rosin sizing and its relationship to kind of rosin and conditions of formation. Das Papier 8, no. 13/14: 242-7 (July, 1954). [In German; English and French summaries]

The author postulates that the sizing process takes place on the walls of capillary spaces, whereby the rosin particles are fixed on the fiber by means of aluminum ions; the paper fibers are not glued together by the rosin particles which are small in comparison to the interstices between the fibers. The relationship between particle size (I) and type of rosin was examined, and relations between (I) and the acid or saponification numbers, respectively and, particularly, the unsaponifiable fraction were found. A rosin which on dispersion yields large particles will give a high sizing effect, whereas a rosin dispersed under the same conditions which breaks down into small particles will be a less efficient sizing agent. The former will have high acid and saponification numbers and a low fraction of unsaponifiables, whereas the opposite will be exhibited in the second case. The influence of the conditions of rosin-size preparation on (I) are of secondary importance; the most significant factors are type and concentration of protective colloid and state of motion (agitation). The surface tension between rosin and water is the essential magnitude which will determine the resulting (I). A laboratory method for the relative evaluation of the sizing efficiency of a given rosin is

based on the dispersibility of the rosin. Rosins which are difficult to disperse possess high sizing efficiency and are more economical in use than those which disperse readily. 11 figures and 10 references. E.S.

PAPER SPECIALTIES

ANON. Don't overlook place mats. Paper Sales 14, no. 7: 21 (July, 1954).

The potential sales market for lace and linen place mats, which can be used in many types of food service, for display purposes, and in resale for home use, are outlined. 1 illustration. R.A.S.

ANON. Double troubleshooter. Chem. Week 74, no. 20: 111-12 (May 15, 1954); *cf.* B.I.P.C. 24: 943.

Reference is made to a new facsimile paper employing N,N'-di-β-naphthyl-*p*-phenylenediamine to avoid sparking and too rapid drying, covered by U. S. patent 2,677,651, granted to Dana and Albrook on March 4, 1954. Commercial applications include the possibility of producing facsimile newspapers. 1 illustration. E.S.

ANON. Duplicity. Ind. Bull. A. D. Little no. 310: 2-3 (June, 1954).

Recently developed processes for quick duplication (diazo, photocopying, diffusion transfer, reflex, heat-sensitive copying paper, and photoelectric processes) are reviewed briefly. E.S.

ANON. How to get the most from your wiping dollar. Power 98, no. 6: 150 (June, 1954).

Advantages in the use of disposable paper wipers for industrial wiping needs are pointed out. 5 illustrations. R.A.S.

ANON. Industry's toughest paper. Southern Pulp Paper Mfr. 17, no. 7: 30, 32 (July, 1954).

Synthane-processed paper manufactured by Synthane Corp., Oaks, Pa. is described; the product comes in the basic form of sheets, rolls, and tubes, is used as insulation for electric light switches, light fixtures, and fuse boxes, and may be sawed, threaded, punched, milled, and precision machined. To produce the paper, high-quality, long-fibered stock is impregnated with phenol or melamine formaldehyde, and a predetermined number of layers are laminated under heat and high pressure. 4 illustrations. R.A.S.

ANON. "K-papers" as a protection against corrosion. Verpackungs Rundschau no. 6: 293-4 (June, 1954). [In German] *cf.* B.I.P.C. 23: 739.

The suitability of K-papers (registered trademark of Bosch & Co., Wipperfürth, Germany), flexible impregnated papers with fabric reinforcement, for export wrapping and as a case liner for metal articles is stressed; the test results of three laboratories in Stuttgart, Munich, and St. Gallen are included. The article is very similar to the previous reference. E.S.

ANON. Polsterpack. Verpackungs Rundschau no. 6: 289-90 (June, 1954). [In German] *cf.* B.I.P.C. 23: 722.

Different applications of Polsterpack (trade name of Holzwerke H. Wilhelmi O. H. G., Dorlar über Giessen, Germany) as cushioning material in packaging heavy articles are described. 5 illustrations. E.S.

BEECROFT, ALVARY W. Paper for offset. Paper Mill News 77, no. 27: 136-7, 139 (July 3, 1954); Paper Trade J. 138, no. 26: 66, 69-70 (June 25, 1954).

The author discusses the basic properties required of offset papers for high-speed press operation (including proper trimming and dimensional stability and freedom from curl, coating pluck, and body-stock splitting) and finishing operations, such as cutting, folding, and lacquering. The lack of paper uniformity is the greatest problem which the lithographer encounters. The quality-control program started about four years ago on a limited scale by the Toronto plant of Rolph Clark Stone Ltd. and its gradual expansion to the testing of all paper shipments are outlined. The lithographer would welcome improved color brightness and opacity plus improvements in the basic requirements of paper for better performance on the offset press; the coated-paper manufacturer should keep the growing trend in the use of gloss inks in mind and develop papers with improved strength and surface characteristics. E.S.

BOLLINGER, A. W. Versatile uses of mats, doilies and covers offer salesmen widest possible market opportunity. Paper & Paper Products 96, no. 2: 1, 10-11 (July 20, 1954).

The sales possibilities of specialty paper lace and linen place mats, doilies, and tray covers are outlined; a wide market for the products exists in connection with food service and displays. 1 illustration. R.A.S.

D. E. Label and box-cover papers. Allgem. Papier-Rundschau no. 11: 572-3 (June 5, 1954). [In German]

Box enamels for further decoration by printing, lacquering, embossing, etc. must be smooth and well sized; this applies particularly when lacquering is required in addition, or the lacquer will penetrate and not remain on the surface of the sheet, resulting in a blotchy appearance. If in the case of a rush job a well-sized paper is not on hand, a thin blocking coat of a paste, a decoction of Iceland moss, cellulose lacquer, etc. must first be applied. In the case of multicolor prints, the base paper should not be thin, particularly if embossing is also required. Picking in the printing presses is usually the result of insufficient sizing, the selection of an unsuitable pulpwood, or an excessive percentage of groundwood in the furnish. The converter should always inform the paper jobber about use requirements. Enamels for labels are gummed on one side; the layer should be thin and contain glycerin to keep the paper flexible and prevent curling. Dry storage is essential. E.S.

DAY, FREDERICK T. The manufacture and the applications of metal lined paper. Part 2—Laminating and foil uses. Paper Box Bag Maker: 232-3, 241 (May, 1954); *cf.* B.I.P.C. 24: 822-3.

The continuously growing field of usage of metal papers and boards, particularly in packaging, fancy goods and stationery trades, and window and display backgrounds, is discussed; the processes of lamination, slitting, and sheeting the foil are mentioned briefly. 2 illustrations. R.A.S.

HIGGINS, CHARLES G., and SCHREIBER, HENRY A. Simple

method of measuring opaque objects. Science 120, no. 3106: 76 (July 9, 1954).

A simple inexpensive method of measuring and recording dimensions and shapes of nontransparent objects with Ozalid plan copying paper is described; the unexposed paper, concentrated ammonia for development, and a dishpan covered with a glass pane comprise the entire equipment needed. The object to be measured is placed on unexposed paper so that a sharp dark shadow falls on the paper surface. After a few seconds to a few minutes, lighted parts of the paper are bleached; the paper is then developed in the dishpan with ammonia fumes. Two examples of applications are described. 3 figures. E.S.

KIRKPATRICK, W. A. Paper as it relates to color printing. Am. Pressman 64, no. 8: 6, 8, 10 (July, 1954); Natl. Lithographer 61, no. 6: 32-3 (June, 1954); Printing Equip. Engr. 84, no. 11: 60-1 (August, 1954). [Abridgments]

The increased use of multicolor printing has made numerous changes in the requirements of paper, including a necessity for increases in surface strength, internal strength, smoothness, opacity, and brightness. Particular requirements are specified for multicolor printing with letterpress and offset processes, particularly with coated papers. A choice between blue, pink, and cream tints in the whiteness of papers is dependent on the colors which dominate in the reproduction; complete details of the job involved should be made available to the paper manufacturer. R.A.S.

THE NATIONAL PAPER TRADE ASSOCIATION, INC. Basic product data on kraft wrapping paper. Am. Paper Merchant 51, no. 7: 24-5 (July, 1954).

Standard, No. 1, superstandard or specialty, and machine-glazed kraft wrapping papers, and standard and No. 1 unbleached kraft butchers' wrapping papers are described; definitions and miscellaneous information are given, including basis weight, rolls, sheets, bundles, a formula for computing weight and yardage, and marking and labeling. R.A.S.

RUNYAN, O. H. Know your paper. Inland Printer 133, no. 4: 38 (July, 1954).

A table is presented, listing various types of uncoated papers with average data for the number of pages to an inch and the sheet caliper. 1 table. R.A.S.

SMITH, FRANK E. Lensless copying with sensitized papers. J. Chem. Educ. 31, no. 7: 351-3 (July, 1954).

Although there are many lensless copying materials and apparent processes, there are but two basic document-copying procedures, the print-through method (I) and the reflex method (II); the former utilizes light transmitted through the original document and the latter, light reflected by the document. Three basic sensitive material types are employed: diazo-, iron-, and silver-sensitized paper, film, and related supports. (I) requires a translucent original document capable of transmitting light; it is printed by placing it in contact with the sensitive goods and directing light through the document. Diazo- (Ozalid), blueprint-, and silver-sensitized papers may be employed, the latter either for wet or dry processing. New heat-sensitive papers utilize the heat absorption of the dark-image areas of the document to melt the waxlike coatings to form a visible image. (II) is used for opaque or double-faced

documents; the sensitive goods are placed in face contact with the original, and light is transmitted through the back of the sensitized material to the document face. Reflex images are usually negative tone and always negative reading, thus requiring subsequent reproduction. Diazo- and iron-sensitized papers do not yield satisfactory reflex images, whereas silver-sensitized materials find extensive use. Heat-sensitive papers also work successfully with the process. Another unclassified procedure utilizes a mechanically actuated stylus photocell controlled by light reflected from the original document, with results of a practical quality. E.S.

STOLZMANN, HANZ. The block-bottom bag—the bag of the future? Allgem. Papier-Rundschau no. 11: 573-5 (June 5, 1954). [In German]

The author discusses the use of kraft block-bottom bags in general retailing in the United States; standardization has limited the number of sizes to the most essential ones. In Germany, this type of bag is used only in packaging (sometimes in competition with folding boxes), unfortunately in a number of sizes for the same weights. Manufacturers of machinery and paper converters should co-operate to bring about a reduction in sizes. The application of this type as a consumer bag will depend upon the availability of a strong raw material, like kraft pulp, which is not readily obtainable in Germany. E.S.

PAPER STORING

ANON. A warehouse designed to give better service. Paper Sales 14, no. 7: 14-17 (July, 1954).

Problems encountered and decisions made in planning a new one-story warehouse for the Minnesota Paper and Cordage Co., Minneapolis are discussed. 7 illustrations. R.A.S.

CANADIAN PULP AND PAPER ASSOCIATION. *Technical Section. Engineering Data Sheet Committee.* Storage of paper rolls. Pulp Paper Mag. Can. 55, no. 7: 114 (June, 1954).

Data sheet H-4 is presented, giving formulas for determining the square feet of floor space/ton and the tons of storage capacity/sq. ft. of floor space for rolls of paper stored one, two, three, and four rolls high on end, one roll deep on bilge, and the one roll on bilge combined with each of the other four methods. 1 table and 1 figure. R.A.S.

PENSIONS, INDUSTRIAL

OTIS, HENRY W. Forward looking retirement programs. Paper Trade J. 138, no. 30: 24, 26 (July 23, 1954).

The pulp and paper industry has not developed a general trend in a pattern of retirement programs as have many other industries. It is predicted that the pattern for the industry might be set by the West Virginia Pulp and Paper Co., which has separate plans for salaried and hourly workers both providing basic benefits without cost and additional benefits through an elective contributory arrangement. R.A.S.

PHOTO-ELECTRIC CELL

HANDAL, ARTHUR E. Application of the photo-electronic control. Paper, Film and Foil Converter 28, no. 7: 31-3 (July, 1954).

By incorporating register marks on the web at the same time that a design

is being printed, a photoelectric or other means can be used to determine the relative position of the design to insure accurate register on the cutoff. A phototube scans the web to pick up the register mark; a rotary selector switch gives the relative position of the cutter cycle. The two measures are compared to determine whether they are in the correct relation, and means of adjusting for either one- or two-way register control are outlined. 6 figures. R.A.S.

PHYSICAL TESTING—MOISTURE

CASE, JAMES W. New moisture-sensitive element for relative humidity. Instruments 27, no. 7: 1076-7 (July, 1954).

For the supervision of the moisture conditions of the air in decommissioned (moth-balled) ships after the last war, the Navy purchased and used a large number of the human-hair-type hygrometers. The experience with these instruments brought out their shortcomings and resulted in a study of the principal types of hygrometers on the market and the development by the author of a wood-shaving-type hygrometer element (convolute and spiral types). The investigation revealed that few hygroscopic materials, from plant fiber to plastics, are reliable moisture-sensitive elements; those of white pine shavings proved to be comparable to hair-type elements in accuracy, stability, and response rate. 3 tables, 5 figures, and 4 references. W.A.W.

LEVINE, A. S., and FAGERSON, I. S. A simplified moisture equilibrium apparatus. Tappi 37, no. 7: 299 (July, 1954).

A simple apparatus for the determination of the hygroscopic equilibrium of a foodstuff is described. 1 figure and 3 references. E.S.

PHYSICAL TESTING—PAPER—PRINTABILITY

ALWAY, H. H. T. The quality of paper and board in relation to its usage—printing. World's Paper Trade Rev. 141, no. 23: 1842, 1844, 1846, 1848, 1850 (June 10, 1954); Paper Market: 133-4; 164-6 (April, May, 1954).

The present position is examined of the possibilities of assessing the printing quality of papers and boards as a result of instrumentation studies of the individual properties. The development of a precision proof press as a confirmation of printing quality and as an alternative method of evaluation is described, the emphasis being on the effect of paper and board on the color, the drying, the gloss, and the halftone fidelity of the finished print. Although a few of the fundamental background problems relating to the assessment of paper quality by instrumentation studies alone have been solved and others brought into clearer focus, much still remains to be done before the proof press can be regarded as a purely confirmatory check rather than a necessary auxiliary method of testing. 11 references. E.S.

PHYSICAL TESTING—PAPER—VAPOR TRANSMISSION

VOLLMER, WILFRIED. The flow of gases and vapors through paper. Chem.-Ing.-Tech. 26, no. 2: 90-4 (February, 1954). [In German]

The author describes an apparatus and a technique for measuring the air and water-vapor permeability of paper. In the air-permeability measurement, air flowed from one reservoir through the specimen to a second reservoir. Suitable manometers permitted measurement of the pressure difference across the specimen and of the mean pressure in the system. In the experiments

described, the total pressure in the system was reduced to the desired level, and the pressure in one reservoir was raised 2 mm. of mercury. The pressure difference across the specimen was then observed as a function of time. The logarithm of this pressure difference was a linear function of time at each of the mean pressures. The volume rate of flow (reduced to normal temperature and pressure) per unit pressure difference, the air permeability, was plotted as a function of the mean pressure. For mean pressures in the range of 20-100 mm. of mercury, the plots were linear and the lines had positive slopes. At lower mean pressures, the air permeability tended to be independent of the mean pressure. The flow of air through paper is described in terms of Poiseuille's law of viscous flow and of Knudsen's law of molecular flow. An equation is presented which permits calculation of the mean pore radius of the specimen from measurements of the air permeability at each of two mean pressures. The water-vapor permeabilities of paper were determined with the same apparatus. The system was evacuated and a small amount of water vapor was introduced from a water reservoir to produce the desired water-vapor pressure. The specimen was thus exposed to the selected R.H. for three to five hours. The water-vapor pressure in one reservoir was then increased 2 mm. of mercury and, as water vapor passed through the specimen, the vapor-pressure difference across the specimen was observed as a function of time. As in the case of air flow, the plot of the logarithm of the pressure difference versus time was a straight line for each mean water-vapor pressure. Mean pressures in the range of 1-17 mm. of mercury at 20°C. were used. The water-vapor permeabilities increased rapidly as the R.H. (mean water-vapor pressure) increased. At R.H.'s below 25% the flow of water vapor is believed to take place through the pores of the sheet and to be described by Knudsen's law. At higher R.H.'s diffusion of adsorbed water over the fiber surfaces takes place and plays an increasingly important role as the R.H. increases. The water-vapor adsorption isotherm of the fibers was determined and the Brunauer, Emmett, and Teller adsorption theory was used to calculate the surface concentration of water on the fibers as a function of R.H. Plots of the water-vapor permeability ascribed to surface diffusion (the difference between the total permeability and the portion of the permeability ascribed to flow through the pores) as a function of the product of the surface concentration and the surface-concentration gradient were straight lines. Data in the form of curves are presented for three papers made from sulfite pulp beaten to three levels of freeness. Data for a polyvinyl chloride film are also presented. 1 table, 8 figures, and 10 references. G.R.S.

PHYSICAL TESTING—PULP—OPACITY

JAYME, GEORG, and POMMER, HILDEGUNDE. Opacity changes of pulps caused by beating and alkaline purification and determined on strength test sheets. Das Papier 8, no. 13/14: 259-68 (July, 1954). [In German; English and French summaries]

Following a critical literature review of the theory of opacity measurements, suitable instruments, and factors which exert an influence on opacity, the terms contrast ratio, printing opacity, scattering power Sx, and scattering coefficient S' are defined and formulas for their calculation are given. The authors' experiments for determining the influence of beating and purification were carried out with a Zeiss Leukometer; a modified formula of Kubelka and Munk was used for the calculation of Sx. S' was found particularly suitable for the evaluation of the opacity of pulp test sheets. During beating, S' of an unbleached Mitscherlich sulfite pulp decreases in three stages, at first rapidly, then more slowly, and toward the end again more rapidly. Cold or hot purification (removal of hemicelluloses) of unbeaten pulp increases S' in either case and reaches a maximum with 10% sodium hydroxide. Opacity

changes of purified pulps during beating depend upon the conditions of the purification treatment; in the range of low-purified pulps S' decreases in a manner similar to unbleached pulps, whereas it increases with high degrees of purification. Hot-purified pulps show in all cases the tendency for increased opacity with decreasing hemicellulose content. Opacity values are not always in agreement with transparency data; the former are considered preferable for accurate determinations, particularly in the form of S' values. The authors recommend the regular inclusion of opacity measurements preceding standard strength tests of pulp sheets in the testing schedule. 6 tables, 10 figures, and 45 references. E.S.

PHYSICAL TESTING—WOOD

HEEBINK, BRUCE G. Dimensional stabilizing effect of paper overlays when applied to lumber. J. Forest Products Research Soc. 4, no. 3: 149-51 (June, 1954).

The author describes tests made by the Forest Products Laboratory at Madison, Wis. to determine the effectiveness of paper overlays as a means of reducing dimensional changes in wood. One specimen of yellow poplar core material served as the control, two were crossbanded with veneer, and three were overlaid with urea-resin and phenolic-resin impregnated papers. The results showed that specific combinations of resin-impregnated paper overlays on lumber produce attractive dimensional characteristics. 2 tables and 4 illustrations. R.A.S.

PIGMENTS

BERNDT, K. Titanium white as a pigment for coated papers. Paper-Maker (London) 127: 34, 36-8, 40, 42, 54 (Mid-summer, 1954); *cf.* B.I.P.C. 24: 45.

This is a complete translation of the German original. 10 tables and 4 references. E.S.

PINE

HÄGGLUND, ERIK, and STOCKMAN, LENNART. Sawmill waste of pine as a raw material for the manufacture of sulfite pulp. Svensk Papperstidn. 57, no. 11: 409-10 (June 15, 1954). [In Swedish; English and German summaries]

In view of the large amount of sawmill waste (spruce and pine) in Sweden which is not always within economical shipping distance from sulfate mills, an investigation was made to determine the possibility of using pine sawmill waste for the production of sulfite paper pulp. It was feared that the high resin content of pine might lead to pitch troubles under these conditions. However, laboratory results indicate that the resin readily dissolves during the bleaching operation, even if very mild conditions are used. The strength properties of bleached and unbleached pine-waste sulfite pulps were very satisfactory. There are indications that it might also be possible to make satisfactory unbleached pine sulfite pulp which will not give pitch troubles. 5 tables. E.S.

PITCH TROUBLES

BACK, ERNST. Method for mill evaluation of paper machine pitch troubles. Pulp Paper Mag. Can. 55, no. 7: 137-8 (June, 1954); *cf.* B.I.P.C. 23: 909. [Abridgment]

The article is a partial reprint of the original reference. 4 figures. R.A.S.

GUSTAFSSON, CHARLEY, TAMMELA, VILJO, and LINDH, THORSTEN. Pitch troubles caused by sulphite pulp. II. Paper and Timber (Finland) 36, no. 6: 269-74 (June, 1954). [In English] *cf.* B.I.P.C. 22: 850; 24: 649.

The amount of pitch deposited from suspensions of unbleached sulfite on copper and stainless-steel surfaces under various conditions has been investigated; the apparatus used has been described in the first part of this study. It is shown that the properties of the pitch change rapidly when the pulp is exposed to air. Hence, any tests regarding pitch troubles should be performed with fresh pulp or pulp stored in bales. The various factors investigated included pH, temperature, hard water, and the addition of alum, surface-active agents, and additives which form complex compounds with metal ions. The results indicate that pitch troubles depend not only on the pulp quality, but also on factors such as temperature and acidity of the pulp suspension, the hardness of the process water, the presence of aluminum sulfate, and others. It seems justified, therefore, to regard the pulp suspension, rather than the pulp itself, as the cause of pitch troubles; the pulp represents only one factor in a complicated system. This concept of pitch troubles conforms with some well-known practical observations: there may be pitch troubles in one mill and none in another, although both mills use the same pulp. The troubles may also suddenly disappear, apparently without reason, in spite of the fact that the identical pulp is used all the time. A careful investigation of such cases usually reveals that these phenomena are caused by rapid changes in the acidity or alum concentration of the system. 2 tables, 12 diagrams, and 1 reference. E.S.

PLASTIC FILMS—TESTING

ELLICKSON, B. E., HASENZAHL, V., and HUSSONG, R. V. Gas-transmission measurement. Modern Packaging 27, no. 11: 173-5 (July, 1954).

A single practical method of testing a number of different films in a few days is reported; the apparatus employed includes a gastight container, acrylic forms, Orsat gas-analysis apparatus, a Pitts manometric gas analyzer, and gas-collecting apparatus. Films which have been creased, folded, and heat sealed around the acrylic forms in the same manner in which small retail food packages are handled can be tested for the passage of gas from the inside to the outside or vice versa. The method of test is described, and data are presented on the permeability of oxygen and carbon dioxide gas through six different films—cellophane laminated to itself, aluminum foil (I), saran (II), or Pliofilm, wax-coated saran (III), and heat-sealing cellophane. The experiments showed that (I), (II), and (III) were impenetrable to the test gases, that the gas which permeated the other films was able to pass in either direction, and that the value of the method lies in its adaptability to practical conditions. 4 tables, 2 illustrations, and 5 references. R.A.S.

MARRIOTT, ROBERT H. Polyethylene as a packaging material. Brit. Packer 16, no. 6: 417-19 (June, 1954).

The use of polyethylene as a packaging material for cosmetics is discussed; properties of the film which make it especially suitable are a relatively low specific gravity, resistance to molds and micro-organisms, and flexibility allowing the squeeze ejection of the contents. Although polyethylene is impervious to water, it allows water vapor to diffuse through it; it is more porous than

rubber hydrochloride but less than polyvinyl chloride. It is also permeable to such gases as nitrogen, oxygen, hydrogen, and carbon dioxide. Experiments are reported on the application of a polyethylene container for any preparation containing water; it is concluded that with water content an internal pressure will develop at a rate depending on the thickness of the walls and the actual conditions (temperature and humidity) under which it is stored. The ideal environment for storage is a cool damp place free from draughts; the package should be enclosed in an outer container which will protect it from variations in external humidity and temperature. However, in warmer countries, particularly those with high humidities, further protection may be necessary. 2 tables. R.A.S.

POPLARS

JAYME, G. Poplarwood as a fibrous raw material. From Hesmer, Das Pappelbuch, p. 237-43 (Bonn, Verlag des Deutschen Pappelvereins, 1951). [In German]

In this chapter from an entire book on poplars, the author discusses the chemical composition; fiber length and shape; percentage of cellulose, bast, and bark; specific gravity; pulping procedures; and recent researches on poplarwood carried out outside Germany. 23 references. E.S.

PRINTING AND PRINTER'S INK

DELLER, JACK. Halftone by letterpress on uncoated papers. Paper & Print 27, no. 2: 154-7 (Summer, 1954).

The advantages and possibilities of using uncoated papers for printing halftones by the letterpress process are discussed. The choice of a paper should be made with consideration for acquiring the smoothest possible surface; twin-wire papers, joining the wire sides of two separate webs of paper, are particularly suitable. Further points to remember when selecting the paper are the avoidance of tub-sized bonds and watermarked papers and the purchase of board from the same mill run for a particular job. 4 illustrations. R.A.S.

PIHL, LENNART. Graphic-arts industries in the United States. Grafiska Forskningslaboratoriet Medd. no. 33: 1-48 (February, 1954). [In Swedish]

As a recipient of a Swedish-American traveling fellowship, the author studied the techniques employed in the U. S. printing industries for six months during 1952-53. His report includes chapters on the different printing processes, printing inks and their physical properties, improvements in the printability of papers and boards, machine-coated paper in particular, and the manufacture of printing plates and stereotypes. 4 tables, 27 figures, and a list of institutions, companies, and technical meetings which the author visited. E.S.

PRINTING AND PRINTER'S INK—BIBLIOGRAPHY

SIMMONS, R. H. Developments in the graphic arts—1953. Tappi 37, no. 7: 38A, 40A, 42A, 44A, 46A, 48A, 50A (July, 1954); *cf.* B.I.P.C. 23: 823-4.

In an annotated bibliography, developments in the graphic arts during 1953 are reviewed under the headings: paper, paper testing, printing ink, plastics, photography and color, offset process, and miscellaneous. R.A.S.

PSYCHIATRY

ANON. Psychiatry in industry; a key to better human relations. Southern Pulp Paper Mfr. 17, no. 7: 94-5 (July, 1954).

Examples of how psychiatry is being used in industry are described; psychiatrists have been most effective in aiding troubled workers to cope with their disturbances, participating in supervisory training programs, and helping management to develop sound personnel practices. R.A.S.

PULP STONES

ARNOLD, GEORGE C., and GRANT, N. S. A preliminary study of grinder grit in stock. Pulp Paper Mag. Can. 55, no. 7: 133-6 (June, 1954).

Increased abrasive wear on machine wires, coincident with a change to artificial grinder stones, prompted an investigation of grinder grit. A simple method for the determination of amounts of grit released at sharpenings, dressings, and dullings was devised. A sharpening releases an average of 1.52 pounds of grit, a dressing 9.76 pounds, and a dulling 0.35 pound. Depending on severity and frequency of sharpenings, etc., it is estimated that 50-60% of stone wear is due to normal wear; the remainder is from sharpenings. Grit released at sharpenings is very fine, 50% passing 100 mesh and 30% passing 200 mesh. Removal of this grit is extremely difficult. A major reduction has been accomplished by operating on a sharpening schedule and sharpening more frequently but more lightly than normal. Operating in this manner the amount of grit per sharpening was reduced to 0.64 pounds and dressings were kept to a minimum. Paper-mill operation was excellent during the period of this test, although a steady wood supply and adequate groundwood storage capacity are necessary if freeness fluctuations are to be maintained at a reasonable level. 4 tables and 5 figures. E.S.

PULP WASHING

ARMSTRONG, BRUCE. Modern pressure washing of kraft pulps. Paper Mill News 77, no. 30: 11-13 (July 24, 1954).

The author reviews the merits and drawbacks of diffuser, vacuum, and press washing, with particular emphasis on the last-mentioned method. In this process the pulp from the digester is diluted to pumping consistency by the addition of strong black liquor in the blow tank and pumped to the first press washer, in which the consistency is increased to 40%. The extraction of liquor amounts to about 7.5 pounds/pound of ovendry pulp, equivalent to 83.1% of extraction. Before the pulp is discharged from the press, a stream of dilute liquor from the next press is forced through the pulp from the hollow spindle under pressure, effecting a displacement wash in addition to the extraction. The pulp is then again diluted to pumping consistency in a repulper with dilute liquor from the press following and pumped to the second press where the same operation of pressing and displacement washing is repeated. Normally four presses are used in series; fresh water is employed on the last press only. An alternate method is the mechanical conveyance of the pulp instead of using pumps. The washing is effected by pressure, displacement, and dilution, and ample time can be provided for the diffusion of the soda into the liquor. In a typical high-yield kraft emerging from the blow tank still in chip form, no defibering is needed as in a vacuum washer, as long as the pulp chips are still sufficiently soft when entering the first press. Approximately the same amount of liquor can be extracted, after which operation the output of the first press can be readily defibered in a high-density refiner such as the Jackson and Church Rota-pulper. All work at high

density, whether refining, washing, or bleaching, tends to form pulp nodules or knots which must be reduced to a smooth slurry before screening; this can also be effected in the Rota-pulper at a consistency of 10-12%. A sample set of performance calculations of the press-washing system is included. 1 flow-sheet. E.S.

CALHOUN, T. B. Kraft brown stock washing on vacuum filters. Paper Mill News 77, no. 31: 23-5 (July 31, 1954).

The process of continuous countercurrent brown-stock washing on vacuum filters is described, including the washing of high-yield pulp in semichip form, which must first be mechanically defibered in refiners. The removal of knots contributes materially to good washing of the pulp. Adequate foam-tank and foam-breaking equipment should be provided; the further south the softwoods grow, the greater is the percentage of saponifiable material in the wood with attendant increase in soap and foam in the washing system. It is important to keep the liquor temperature in the system sufficiently high, as a cold soap film is tougher and harder to break down than a hot one. The normal discharge consistency from a vacuum washer is 14% air dry; this may be increased to 16% or more by the addition of a press roll on the last washer stage. The pulp may be repulped to low consistency for screening or shredded and conveyed to high-density storage chests. E.S.

PYRITES

LINDQVIST, PAUL S. Operation experiences in the roasting of Outokumpu flotation pyrites in a fluidized-bed furnace. Paper and Timber (Finland) 36, no. 6: 279-81 (June, 1954). [In Swedish; English summary]

The author gives preliminary data on the experience gained in the roasting of pyrites in the Kuusankoski sulfite mill of Kymmene Aktiebolaget. For a period of six months the mill has roasted Finnish flotation pyrites in a fluidized-bed furnace of the Badische Anilin- and Soda-Fabrik, constructed by Lurgi-Chemie (*cf.* B.I.P.C. 23:277). As soon as the feeding apparatus had been partially reconstructed, the roasting was successful. The guaranteed capacity of the furnace is 80 tons of pyrites per day; the mill has not yet reached full production, so that the furnace has so far operated with a load of 50-60 tons. However, there seems to be no doubt that not only can the full load be carried, but also that the maximum capacity lies considerably higher. The furnace gases contain about 14% of sulfur dioxide and, after passing through the washing tower, 12-13%. The sulfur loss in the ash is about 1.5%. Heat in the form of steam is extracted from the gases to the extent of about 1.2 kg. of steam/kg. of pyrites. The La Mont boiler is constructed for a pressure of 40 atm. and a capacity of 4.2 tons of steam/hour. For the purification of the gases both cyclones and electrical devices are employed; two washing towers are installed between the dry and wet electrical purification stages. After passing the purification installations, the gases are completely free from ash and other impurities. 3 tables. E.S.

RADIOACTIVITY

FIEBIGER, HARALD. Measurement without actual contact of the basis weight of the moving paper web by means of beta rays. Wochbl. Papierfabrik. 82, no. 11: 452, 454-6, 458-9; no. 13: 541-7 (June 15, July 15, 1954). [In German]

Following an introductory discussion of the theory of radioactivity, the

author outlines the principles of β-radiation and its application in measuring basis weight. Reference is made to the principal instruments used in different countries, and the apparatus most generally used in Germany (thickness meter FH 46 employing thallium 204, manufactured by Frieseke & Hoepfner) is described in detail. The limitations and possible errors of the technique are discussed at length. Normally the accuracy of the measurements falls within the tolerances permitted by industry; only when the basis weight drops below 50 grams/sq. m. does the error exceed 2%. Fillers, if present in large amounts, may also cause errors; e.g., a magazine paper whose basis weight was 81 grams/sq. m. and which contained 32% of kaolin showed an apparent average basis weight of 83.5 grams/sq. m. However, in most cases errors caused by loading agents are slight. 2 tables, 16 figures, and 9 references.
L.E.W.

RAIN AND RAINFALL

WETTERER, CHARLES S. Rainfall stimulation for forest fire prevention and control. Pulp Paper Mag. Can. 55, no. 7: 166, 168, 171, 173 (June, 1954).

The principles of the rainmaking science, results of experiments, and instances where the control of rainfall is particularly beneficial are discussed. Programs have been operated for pulp and paper companies for the primary purpose of providing additional stream flow for process water and the reduction of stream pollution. Experiments on the use of rainmaking for fire prevention and control are reported. R.A.S.

RAYON—VISCOSE PROCESS

SCHRAMEK, W., and AHRBERG, LISA. The swelling and dissolution mechanism of xanthated alkali cellulose fibers. VIII. Faserforsch. u. Textiltech. 4, no. 6: 229-49 (June, 1953). [In German] *cf.* B.I.P.C. 22: 768.

In a study of the filtration difficulties often encountered in the viscose process, the swelling and the dissolution of sodium cellulose (with particular reference to the outer skin substance and secondary wall) have been followed microscopically and cinematographically during the various stages of xanthation and dissolution of the xanthate. The changes occurring during these reactions are discussed by means of 44 photomicrographs. 49 figures and 146 references. F.E.B.

RESEARCH

HOVEY, REX W. Fact-finding. Tappi 37, no. 7: 26A, 28A, 30A (July, 1954).

Valuable sources of facts and information which serve as background for research and development work are outlined, including market research, literature survey, pilot-scale operations, statistical analysis techniques, high-speed photography, and sales-service departments. The importance of human relations in the research department and between research, sales, management, and other departments is emphasized. R.A.S.

WASTLER, T. A. Naval stores industries—research needs. Georgia Inst. Technol. State Eng. Expt. Sta. Bull. 20: 63 p. (1954).

The advances made in all phases of the naval stores industry during the first half of the 20th century are outlined, the present state of technical

knowledge is summarized, and a long-range research program is set forth which can serve as a guide for further advancement in the field. The subject matter is discussed under the main headings: forest practices and raw materials, processing methods (including sulfate pulping), basic products (including sulfate turpentine and tall oil), and chemical derivatives of basic products. 8 tables, 17 figures, and 38 references. E.S.

RESEARCH LABORATORIES

ANON. Survey of future plans for the SSFF institutes. Norsk Skogind. 8, no. 6: 194-204 (June, 1954). [In Norwegian]

During the annual meeting of Skogbrukets og Skogindustrienes Forskningforening (the Forestry and Forest Industries' Research Organization, SSFF) on May 21, 1954, the plans for the following institutes were discussed: Holte, T. The Norwegian Pulp and Paper Institute (the incorporation of a graphic-arts department and the purchase of a small German experimental paper machine)—3 illustrations, p. 194-7; Klem, Gustav G. The Norwegian Institute of Wood Working and Wood Technology, p. 198-200; Nossen, Øyvind. The Forest Industries' Economic Institute, p. 200-2; and Anker-Rasch, Fritz. The Transport Committee, p. 202-4. E.S.

EIDE, ERLING. The aims and operating plans in Norwegian forest research. Norsk Skogind. 8, no. 6: 205-9 (June, 1954). [In Norwegian; English summary]

The Norwegian Forest Research Institute was established in 1917 as an official central institute for forest research; its task was to investigate and clarify the conditions of basic importance to the development and growth of forests, efficient felling, and wood transportation, and to the economics of silviculture and afforestation of unproductive lands. Co-operation of the institute with the industry is of utmost importance; qualified specialists must be assigned to the individual problems and work in collaboration with the research staff to investigate the problems from biological, technical, and economic angles. A survey is given of the most important research projects with which the different departments of the institute are dealing at present to improve the productivity of the forests. E.S.

KOVALCIK, JEROME G. Wood products research at the State University of New York College of Forestry. J. Forest Products Research Soc. 4, no. 3: 115-19 (June, 1954).

The wide range of research activities at New York State College of Forestry of interest to wood-using industries are outlined, with particular studies discussed in the fields of entomology, botany, chemical debarking, wood technology, utilization of wood products, pulp and paper technology, and chemistry. A description is given of the new Wood Products Laboratory building and equipment; construction of the building is expected to begin in 1954. 3 illustrations. R.A.S.

PULP & PAPER. Time Inc. laboratory may unveil new horizons to pulp and paper. Pulp & Paper 28, no. 7: 36-9 (July, 1954); *cf.* B.I.P.C. 16: 344.

The activities of the laboratories of Time Inc. at Springdale, Conn. are reviewed and plans for starting pulp and paper research on a co-operative basis with the pulp and paper industry are mentioned. Areas of greatest cost and the best potential for cost reduction in paper manufacture are at present being determined; any expenditures for pilot-plant pulp and paper equipment

are being withheld until the process of attack has been decided. 7 illustrations. E.S.

RESIN, SYNTHETIC

EIRICH, F. R., and SILBERBERG, M. Survey of progress in the field of unsaturated polyesters. Tappi 37, no. 7: 134-9A (July, 1954).

The authors review recent developments in the field, including polyester resin components, compatibility, nature of the prepolyester, additional means of curing, and inhibition of polymerization of unsaturated polyesters. 6 tables, 4 figures, and 33 references. E.S.

KAUFMAN, H. S. Modified polymers containing fluorine. Tappi 37, no. 7: 140-3A; discussion: 143-5A (July, 1954).

The author discusses the properties of chlorotrifluoroethylene (I), plasticized (I) resins, methods of fabrication, and applications, with particular reference to KEL-F resins, the registered trade-mark of the M. W. Kellogg Co., Jersey City, N.J. 2 tables, 4 figures, and 6 references. E.S.

ROCHOW, T. G. Resinography. Tappi 37, no. 7: 125-8A; discussion: 128A (July, 1954).

The results of resinography and applications to the paper industry are reviewed. E.S.

WALB, T. A. Epoxy resins. Tappi 37, no. 7: 129-34A; discussion: 134A (July, 1954).

The author reviews some of the highlights of epoxy resins, including their chemistry and physical properties, surface-coating and structural uses, and foamed EPON resins. 9 tables. E.S.

RETIREMENT

CAMERON, J. C. Compulsory retirement—right or wrong? Paper Mill News 77, no. 27: 126, 128-9, 158 (July 3, 1954).

Arguments for and against compulsory retirement, especially at age 65, are presented. 2 references. E.S.

ROSIN

ANDERSON, ARTHUR B. Rosin from Jeffrey pine stump wood. Tappi 37, no. 7: 316-20 (July, 1954).

This preliminary investigation was undertaken to evaluate the extractives present in Jeffrey pine stumps as a possible source of chemical products. The heartwood of well-seasoned Jeffrey pine stumps was found to contain about 26% benzene-soluble extractive material. Over half of the extract consists of resin acids and, on refining the crude extract by commercially used processes, good recoveries of refined wood rosin were obtained. The properties and characteristics of the rosin, so prepared, are comparable to those of commercially produced refined wood rosins. The rosin contains about 80% resin acids, which are of the diterpenic type. Of the total resin acids present, approximately 58% appears to be of the two double-bond abietic acid type. 3 tables, 1 figure, and 27 references. E.S.

SALESMEN AND SALESMANSHIP

ANON. Specialties for hotels. Paper Sales 14, no. 7: 19 (July, 1954).

The fact that paper specialties offer the easiest and least expensive way to give the impression of cleanliness and good service is the principal point to be stressed by paper salesmen in selling paper specialties to hotels, motels, and tourist courts. R.A.S.

SEMI-CHEMICAL PULPING PROCESS

KUHLMAN, MYRON G. The semichemical pulping process for East Texas hardwood. J. Forest Products Research Soc. 4, no. 3: 136-8 (June, 1954).

The author reviews the growth of the semichemical pulping process, particularly the pulping of sweet and black gum found in the East Texas pine-hardwood belt. The usefulness of semichemical pulp as an additive to produce a better grade kraft test liner shows promise; the difficulties in blending and refining the various furnishes are discussed. The author concludes that there seems to be no doubt that all of the hardwood resources will be necessary to keep pace with the industry's growth. 3 references. R.A.S.

SHIPPING CONTAINERS

ANON. Fiber containers conquer new worlds—here's how wood boxes lost 2 battles. Pulp & Paper 28, no. 7: 40-2 (July, 1954).

Reference is made to the increasing replacement of wooden boxes by fiber shipping containers in the citrus industry of California, Arizona, and Florida and to the change-over from packing lettuce with ice to dry-field packing and vacuum cooling permitting a shift from wooden crates to fiberboard containers. Other applications, some past the development stage, include the packaging of carrots, tomatoes, and (possibly) celery in fiberboard boxes; in Canada, apples are being shipped in increasing quantities in several styles of fiberboard containers. 5 illustrations. E.S.

FOOD ENGINEERING. Citrus goes corrugated. Food Eng. 26, no. 7: 127, 136 (July, 1954).

The numerous advantages in the packaging of citrus fruits in corrugated shipping containers, as shown by tests carried out by several fruit growers on the West Coast, are discussed. A saving of about 71 cents per standard box is estimated. 1 illustration. R.A.S.

SODIUM ALUMINATE

KLEMM, K. H. Sodium aluminate in the paper industry. Wochbl. Papierfabrik. 82, no. 11: 437-8, 440 (June 15, 1954). [In German] *cf.* B.I.P.C. 24: 656.

The properties and possible applications in paper mills (sizing, white-water clarification, and foam suppression) of sodium aluminate are discussed. 3 figures. E.S.

STANDARDIZATION

CENTRAL SCIENTIFIC COMPANY, *Chicago.* Instruments manufacturer slims down packaging. Packaging Parade 22, no. 258: 66, 68 (July, 1954).

A packaging standardization program started three years ago by the company resulted in a reduction from 53 to 43 different sizes of corrugated shipping containers and from more than 200 to 24 different kinds of wooden containers for packaging delicate instruments. 4 illustrations. R.A.S.

STARCH

BIRD, R., and HOPKINS, R. H. The action of some α-amylases on amylose. Biochem. J. 56, no. 1: 86-99 (January, 1954).

The relative susceptibility of glucosidic linkages of amylose to attack by various α-amylases was studied. The amylases of malt and *Bacillus subtilis* attack with great difficulty the second to the fifth linkages from the nonreducing end and the first (malt amylase) or first two (*B. subtilis* amylase) linkages at the reducing end of the polymer chains. Within these points other linkages are attacked at random. When the system is sufficiently dilute, the action of these enzymes is almost confined to dextrinization, and achroic dextrins (chain length 6-8 units) are attacked very slowly. Some maltotriose, maltose, and glucose are formed by fission of longer chains, but the yield of glucose is far less than expected from random fission. Ultimately, however, amylose is hydrolyzed to maltose and glucose. Salivary α-amylase does not readily attack the first two linkages from the nonreducing end and the first linkage from the reducing end of amylose. Fungal α-amylase resembles the salivary enzyme, but appears to show a stronger action upon the trisaccharides. A hypothesis is suggested to explain the actions of the α-amylases. 10 tables, 2 figures, and 24 references. J.W.S.

HIRST, E. L., and MANNERS, D. J. Multiple-branching in amylopectin. Chemistry & Industry no. 8: 224-5 (Feb. 20, 1954).

The enzymatic method of Peat, Whelan, and Thomas (*cf.* B.I.P.C. 23: 438) may be used for quantitative estimates of the degree of multiple branching of amylopectin. It is shown that only 20% of the unit chains of waxy maize starch are branched at more than one point. Therefore, the molecular structure approximates a laminated elongated molecule instead of a treelike structure. Glycogen possesses a higher degree of multiple branching than amylopectin. 2 figures and 15 references. J.W.S.

STATIC ELECTRICITY

FINE, RICHARD D. The occurrence, behavior and elimination of static on textiles. Am. Dyestuff Reptr. 43, no. 13: P405-8 (June 21, 1954).

Following an explanation of the mechanism by which charges of static electricity accumulate on textiles, especially on those of a hydrophobic type, the author discusses their elimination by grounding, air ionization, humidification, and application of chemicals. The chemicals used for this purpose can be divided into inorganic salts, nonionics, cationics, anionics, and ampholytes. The selection and evaluation of chemical antistatic agents on yarns and fabrics by simple laboratory procedures not involving the use of instruments are described; precision methods with the aid of instruments are also listed. 4 references. E.S.

HAYEK, MASON. Antistatic finishes for textiles. Am. Dyestuff Reptr. 43, no. 12: P368-71; discussion: P371 (June 7, 1954).

The fundamentals of static electricity on textiles are reviewed, and the mechanisms of antistatic action are described. To be generally effective,

antistatic agents must reduce the electrical resistance of textile surfaces. The manner in which this is accomplished by various compounds is discussed. 5 tables, 3 figures, and 36 references. E.S.

STEAM POWER

ANON. How coal can be recovered and fly-ash removed quickly and cheaply. Paper Trade J. 138, no. 29: 22, 24 (July 16, 1954); Tappi 37, no. 8: 116-18A (August, 1954).

A central vacuum cleaning system installed in the boiler room at Clifton Paperboard Co., Clifton, N.J. serves to clean fly ash from the boilers and to recover the unused coal. 2 figures. R.A.S.

BECK, ALBERT. The development and construction of a modern industrial heating and power plant. Wochbl. Papierfabrik. 82, no. 11: 440, 442, 444-6, 448-51 (June 15, 1954). [In German]

The gradual enlargement of an industrial high-pressure steam power plant with peak loads, an independent hot-water heating system which can be cut off during the summer months, regulating problems, and economical considerations are discussed. 8 figures. E.S.

MATOUCH, RUDOLF. A balanced steam-power plant installation. Das Papier 8, no. 13/14: 274-9 (July, 1954). [In German; English and French summaries]

The author describes a back-pressure steam turbine installation in a German pulp and paper mill in which the periodically arising steam peaks from the one-digester room are utilized in the grinder room. 8 figures. E.S.

STRAINS AND STRESSES

MEREDITH, R. Relaxation of stress in stretched cellulose fibres. J. Textile Inst. 45, no. 6: T438-61 (June, 1954).

An apparatus is described for making stress-relaxation tests on yarns or monofils at controlled humidity and temperature. It incorporates an optical lever for measuring the tension, and observations can be made from 1/20 second after the start of an experiment up to several weeks. Cotton, flax, viscose, and cellulose acetate yarns were rapidly stretched at 65% R.H. and 25°C., and the decay of tension followed for 24 hours. Further tests were made in which the specimens were held stretched for 15 minutes and relaxed for two hours, repeatedly, until mechanically conditioned. The results are expressed graphically as stress against log (time) and are in good agreement with those of other workers, over the limited time range which they have used. The fraction of the initial stress which decays is quite large. Thus taking the stress at one second after extending as a reference value, the decay of stress from 1/10 second to a day is approximately 30-50% for cotton, 42-83% for viscose rayon, and 33-85% for cellulose acetate, depending on the imposed extension. The data for cotton and flax have been analyzed according to the Nutting power law relating stress, strain, and time. Reaction-rate theory, applied to the stress relaxation of viscose rayon and cellulose acetate, gave activation energies of about 26 kg.-cal./mole for viscose rayon and 27 kg.-cal./mole for cellulose acetate, for extensions from 2-20%. From the slope of the stress-log (time) curves between 1/10 and 1 second, the "internal friction" was calculated for the viscose rayon and cellulose acetate and the values obtained agree well with those calculated on the same materials from vibration experiments at a frequency of 50-100 cycles/second. In appendices, it is shown that high extensions with certain yarns which have

not been mechanically conditioned will produce an appreciable rise in temperature and that the duration of stretching is in the region of 1-10 milliseconds. 4 tables, 11 figures, and 23 references. E.S.

STREAM POLLUTION

WEST VIRGINIA PULP AND PAPER COMPANY. Start construction on W. Va.'s $2,000,000 waste treatment plant. Paper Trade J. 138, no. 28: 10-11 (July 9, 1954); Paper Ind. 36, no. 5: 470-1 (August, 1954); Southern Pulp Paper Mfr. 17, no. 8: 52, 54-5 (August, 1954).

Designed for a maximum capacity of 24 million gallons/day, the new installation at Covington, Va. will treat the wastes from the mill's woodyard, pulp mill, chemical plants, the first two stages of the bleaching operation, and the carbon plant. The mill wastes are run into a primary settling tank where all the solids are settled out during a retention period of about two hours. The liquid portion of the wastes is then pumped to a mixing box seeded with bacteria and other micro-organisms; quantities of phosphorus and nitrogen are added to provide a balanced diet upon which the bacteria can thrive. The activated sludge (waste liquids, added chemicals and the gelatinous mass of bacteria) is then pumped to deep aerating channels; after a period of three hours, the bacteria have consumed from 80 to 90% of the harmful organic material in the waste. The aerated material is then sent to a final settling tank where the activated sludge settles during a three-hour retention period, leaving the clear water behind which is released to the stream. The settled sludge is returned to the mixing box for re-use. 1 flowsheet and 1 illustration in the first and third and 1 flowsheet in the second reference. E.S.

SUGARS

FREUDENBERG, KARL. Contribution to the configuration problem. Monatsh. Chem. 85, no. 3: 537-47 (June 15, 1954). [In German]

After the author has succeeded in chemically connecting the simplest optically active hydrocarbon, methylethylpropylmethane or 3-methylhexane with the configurative system of glucose, he gives a review of his work on the configurative relationships and the optical rotatory power. Efforts to determine the absolute configuration show that the configuration suggested by Emil Fischer for glucose represents the absolute configuration from which, in turn, follows that all spatial formulas based on that of glucose represent absolute configurations. 1 table and 61 references, most of them Freudenberg's work. F.E.B.

SULFATE MILLS

ANON. New Buckeye 300-ton pulp mill. Paper Mill News 77, no. 31: 12-15, 18 (July 31, 1954); *cf.* abstract p. 1014.

Essentially the same description as in the following reference is given. 16 illustrations. E.S.

ANON. Chemical pulp booms in South. Chem. Eng. News 32, no. 28: 2756-8 (July 12, 1954).

Two new $25 million plants for producing high-grade dissolving pulp from wood pulp were opened by Buckeye Cellulose at Foley, Fla. and by Rayonier at Jesup, Ga.; the former uses a prehydrolyzed sulfate process, and the latter a new process which is part kraft and part sulfite, with finishing treatments which the company is not discussing. The Jesup mill, Rayonier's fifth, brings the total company capacity to more than 572,000 tons annually, equivalent to

50% of the nation's chemical cellulose total. The Foley mill is Buckeye's first plant using wood pulp; the company produces 40% of the nation's total of alpha cellulose from cotton linters. Both mills operate woodlands to supply their complete requirements. 1 table and 7 illustrations. R.A.S.

EVANS, JOHN C. W. How dissolving pulp is made at Buckeye's new mill. Paper Trade J. 138, no. 31: 14-20 (July 30, 1954).

A detailed description of the new 300-ton/day dissolving pulp mill at Foley, Fla. of Buckeye Cellulose Corp., a subsidiary of Procter & Gamble of Cincinnati, is given. The mill employs an acid prehydrolysis-kraft process for cooking pinewood, principally leaf, slash, and loblolly pine. Much of the equipment is left in the open or only covered by a roof; where the possibility of contamination with airborne dirt exists (brown-stock washing, bleaching, machine room, etc.), the areas are not only totally enclosed but supplied with filtered air. Cooking is carried out in nine stainless-steel digesters; the bleach plant consists of typical Kamyr continuous equipment, and the pulp is dried on a Sandy Hill Fourdrinier machine. All pulp is wound into jumbo rolls. The mill effluent is pumped to a large settling tank, and the solids are pumped from here to a retaining lagoon; only clarified effluent is discharged to the river. Deep-well pumps supply the daily requirements of 26,000,000 gallons of water. 10 illustrations. E.S.

PAPER TRADE JOURNAL. Rayonier's 5th plant opens at Jesup, Ga. Paper Trade J. 138, no. 28: 16-20, 22 (July 9, 1954); *cf.* B.I.P.C. 24: 143.

The outstanding features of the new 86,000-ton dissolving pulp mill of Rayonier are described. The mill uses a significantly new process, having elements of the kraft process but with extensive modifications; details are not yet ready for publication. The soil for the new plant was prepared by vibro-flotation; special Georgia bricks were used for most of the permanent walls. The mill will consume approximately 200,000 cords of wood/year; at present all production is from southern pine, but it is expected that local hardwood will also be utilized later on. Details of wood handling, barking, chipping, pulping equipment (eight stainless-steel lined digesters with external liquor circulation and indirect heating), pulp washing, chemical recovery, multistage continuous bleach plant, pulp drying (Rice Barton pulp machine), finishing room, power plant, and water supply are given. 9 figures. E.S.

SULFITE MILLS

THOMPSON, A. L. New $52 million Ketchikan mill starts operations in Alaska. Paper Mill News 77, no. 31: 9-11 (July 31, 1954); *cf.* B.I.P.C. 22: 860.

On July 14, 1954, the Ketchikan Pulp Co. officially dedicated its new pulp mill, a joint enterprise of The Puget Sound Pulp Co. and the American Viscose Corp.; the latter has contracted for 100,000 tons/year for the next 20 years of the Ketchikan output. The colorful dedication ceremonies are described. 9 illustrations. E.S.

SULFITE PROCESS

RYDHOLM, SVEN. The acidity during the sulfite cook. Svensk Papperstidn. 57, no. 12: 427-36 (June 30, 1954). [In Swedish; English and German summaries]

In spite of its importance during all the reactions of sulfite digesting, the

acidity during the sulfite cook has been little investigated. The pH of the cold cooking liquor does not correspond to its acidity at cooking temperature, and direct measurements in the digester are difficult to perform. The acids in the cooking liquor and those formed during the cook are present as undissociated, completely dissociated, and partly dissociated acids like sulfurous acid. The dissociation constant of sulfurous acid decreases with a rise in temperature, and this influence on the acidity can be calculated. One type of strong acid, the α-hydroxysulfonic acids, are unstable and occur in lower concentration at cooking than at room temperature. The concentration at cooking temperature can be determined by special methods. When the change in the α-hydroxysulfonic acid concentration and in the sulfurous acid dissociation are known, the acidity at cooking temperature can be calculated from the pH determined on cooled liquor samples. Three types of sulfite cooks were followed by these methods. The acidities of Mitscherlich pulp and strong paper-pulp cooks were found to be relatively constant, corresponding to pH > 2, whereas dissolving-pulp cooks exhibited about the same acidity during the main part of the cook and showed a considerable increase in hydrogen-ion concentration during the last part of the cook. During this latter period, the decrease in vicosity and the principal change in color of the cooking liquor also take place. The analytically determined "combined sulfur dioxide" bears a certain relation to the buffering capacity of the bisulfite and to the observed acidity changes. An equation is developed and graphically illustrated which shows the dependence of the hydrogen-ion concentration upon the combined sulfur dioxide, the total sulfur dioxide, and the dissociation constant of sulfurous acid. In this way the characteristic shape of the experimentally determined acidity curves is confirmed. 8 tables, 10 figures, and 19 references. E.S.

SULFITE WASTE LIQUOR

AMBERG, H. R., and STRANG, A. G. The design and effectiveness of an underwater diffusion line for the disposal of spent sulphite liquor. Tappi 37, no. 7: 307-13 (July, 1954).

A problem associated with the discharge of spent sulfite liquor into the Columbia River has been excessive bacterial slime growth. These filamentous growths of *Sphaerotilus,* which are dependent upon the sugar fraction in the waste, were of particular nuisance near the Vancouver area since the sloughed growths would collect and become attached to the gill nets of the commercial fishermen, making commercial fishing operations extremely difficult during certain periods of the year. Previous studies indicated that no significant growth would develop at spent sulfite liquor concentrations below 50 p.p.m. of 10% liquor. Since sufficient dilution water was available in the Columbia, it was decided that underwater diffusion lines would be effective in diluting the liquor below the minimal concentration required for excessive slime growth. The authors present a description of the underwater diffusion line installed at the Columbia River Paper Mills at Vancouver, Wash., as well as survey data used to arrive at a rational design of the underwater outfall. Comprehensive stream surveys were conducted before and after the installation of the underwater outfall to ascertain the degree of improvement effected by the outfall. Since the underwater diffusion line has been installed, the waste concentration in critical areas along the shoreline has been reduced by 95% and concentrations of spent liquor are considered sufficiently low to prevent excessive slime growth. 5 tables, 9 figures, and 3 references. E.S.

SULFUR

ANON. Sulfur in better balance. Chem. Eng. News 32, no. 15: 1522 (April 12, 1954).

Based on data recently released by the Bureau of Mines, the 1953 output of mined (native) sulfur amounted to 5,155,342 long tons, 3% less than in 1952, whereas the 337,000 tons of recovered sulfur produced was 36% greater than in the previous year. New Frasch projects; foreign, notably Japanese expansion; and the production of pyrites are also discussed. Freeport Sulphur states that four fifths of the U. S. sulfur supply enters sulfuric acid; the other fifth is used as elemental sulfur or in other chemical compounds. Pulp manufacture accounted for 7.5% of sulfur consumption by industries in 1953. 2 tables. E.S.

ANON. Sulfur mines not being pushed. Chem. Eng. News 32, no. 27: 2732 (July 5, 1954).

The Frasch mine output of elemental sulfur is expected to be somewhat above five million long tons in 1954; the new sulfur mines are not being pushed, because demands do not justify it. Exports this year will be larger and would probably be much larger were it not for recovery and pyrites processes placed in operation in European chemical nations. Statistical data for 1950, 1951, and 1952 from a special report (fourth in a series) by the Business and Defense Services Administration are included; they do not differ very considerably from those previously supplied by the Bureau of Mines. 1 table. E.S.

SURFACE AREA

ALLEN, J. A., and HAIGH, C. J. The permeability method for the measurement of surface areas of fine powders. J. Chem. Educ. 31, no. 7: 354-6 (July, 1954).

The theoretical background of the permeability method based on the measurement of rate of flow of air or another suitable fluid through a plug of the powder is briefly reviewed. A simple inexpensive apparatus suitable for laboratory courses in physical chemistry is described; it requires a minimum of constructional skill and has proved its reliability. A useful comparison is made between the results of a large number of measurements on nickel oxalate precipitates carried out with this apparatus and those obtained with a simple optical method. Some important limitations for very fine powders are indicated. 1 table, 2 figures, and 9 references. E.S.

TAILINGS

BRINGMAN, R. E. Use of Jackson Church press in handling pulp mill rejects. Tappi 37, no. 7: 286-90 (July, 1954).

A brief resume of St. Joe Paper Co.'s reject-handling systems is presented, covering those previously employed along with the system presently used, which employs a Jackson Church Zenith press. Laboratory studies are outlined, illustrating the use of a Jackson Church type 015 high-density refiner. These studies indicate the feasibility of using such a unit to refine the high-density rejects without experiencing any degrading effect on the resulting linerboard stock. 8 figures. E.S.

WET STRENGTH

AMERICAN CYANAMID COMPANY. The past, present and future of wet-strength papers. Paper, Film and Foil Converter 28, no. 7: 19-22 (July, 1954).

Wet-strength paper is expected to play a big role in the expansion of the

paper market, calculated at 1000 pounds of paper/person in the United States in 1980. Properties of wet-strength papers (Melostrength papers of the company) are compared with ordinary papers in tensile, fold, and printing qualities. Applications in special products such as ice-cube bags, potato bags, filter papers, etc. are discussed; a big future is looked for in disposable and nondisposable wearing apparel. 3 tables and 4 figures. R.A.S.

WOOD—CHEMISTRY

WACEK, A., ZEISLER, F., and RIEGELMAYER, P. The methoxyl content of sprucewood. Monatsh. Chem. 85, no. 3: 499-525 (June 15, 1954). [In German]

The authors carried out a detailed investigation of the fate of the methoxyl groups (I) present in sprucewood during the lignin determination before and after various pretreatments of the wood, and during the isolation of the holocellulose and its lignin determination. About 85% of the (I) content as determined according to Vieböck-Schwappach is recovered in the lignin, the fate of the missing 15% is unknown. When sprucewood [(I) content 5.2%] previously extracted with benzene-alcohol is treated according to Klason with sulfuric acid of various concentrations (from 52 to 80%), the yield of lignin residue reaches a minimum of 27.25% with the highest (I) content of 16.13% at a sulfuric acid concentration of 64%. The (I) content in this lignin corresponds to 4.396% in the wood or to a loss of 0.804%. This loss increases with increasing concentration of the sulfuric acid and amounts to 1.093% at an 80% sulfuric acid concentration. Alkaline pre-extraction of sprucewood with 24% potassium hydroxide at room temperature results in an 86% recovery with a (I) content of 5.36%, a lignin content of 29.3%, and a (I) content of the lignin of 15.6%, from which a loss of (I) of 0.68% is calculated. When the wood is extracted with 24% potassium hydroxide for 12 hours on a waterbath, a residue of 71.62% is recovered with 5.4% (I), 29.7% lignin, and 15.99% (I) in the lignin, corresponding to a loss of 1.406% (I) during the alkaline extraction, and 0.466% during the lignin determination. Experiments with model substances show that 3-O-methylglucose behaves very similar to sprucewood, indicating that 0.35% of the (I) content in the wood may be combined in a way similar to that in methylglucose. Of the 0.4% (I) which is not found in the sulfuric acid lignin, 0.2% is split off under very drastic conditions which would indicate that it is aromatically combined; the remaining 0.2% is either present in hydrolysis cleavage products or is lost during the analysis. All of the (I) determinations in the hydrolyzates were carried out by direct methanol determination, those of the lignins (which are practically free of carbohydrates) by the Vieböck-Schwappach method. Experiments with model substances, with dehydrogenation polymers according to Freudenberg, and with isolated native lignin indicate that in some compounds aromatic (I) are much less stable than hitherto assumed. The type of hydrolysis and the position of the (I) with regard to other substituents plays an important role. Whereas vanillic acid is stable toward alkali and supersaturated hydrochloric acid, up to one third of its (I) are split off under the conditions of the Klason determination. The results obtained are of great importance for the analysis of wood. Not all of the readily split-off methanol or of the loss of (I) can be attributed to esters or ethers of carbohydrate-containing compounds; a part of the lignin (I) seems to be lost during its isolation. Through the formation of free phenolic hydroxyl groups, the lignin becomes more reactive and parts of the lignin are rendered soluble. 15 tables and 57 references. F.E.B.

WOOD—EXTRACTIVES

FREUDENBERG, KARL, and HARTMANN, LUDWIG. Extraneous

components of *Robinia pseudacacia*. Ann. Chem., Justus Liebigs 587, no. 3: 207-12 (June 25, 1954). [In German]

The highly durable, fungus-resistant wood of black locust contained about 2% robinetin (3,7,3',4',5'-pentahydroxyflavone), 0.02% of another flavone (separated from robinetin chromatographically), and 5.3% of 2,3-dihydrorobinetin, melting at 226-228°C. (decomposition). Various derivatives of the latter are described. The authors also outline techniques for the extraction of two related glycosides from the leaves of the black locust—acaciin and acacetin trioside. A number of chromatographic separations of the locustwood components are described. 12 references. L.E.W.

WOOD OPERATIONS

CURRIE, D. V. The role of the small tractor in the bush. Pulp Paper Mag. Can. 55, no. 7: 156, 159 (June, 1954).

A small tractor is a useful tool for such pulpwood operations as skidding logs, loading gravel and sand, loading logs and pulpwood, breaking out strip roads, road maintenance on truck haul roads, portaging supplies and equipment, and fire fighting. R.A.S.

EDGERTON, C. H. Economical lunching out. Pulp Paper Mag. Can. 55, no. 7: 174 (June, 1954).

The advantages and possible methods of providing woods workers with hot noontime meals are discussed. R.A.S.

GODWIN, G. Development of mechanical logging methods between the stump and final landing for Eastern Canada. Pulp Paper Mag. Can. 55, no. 7: 142-4 (June, 1954).

Consideration of all factors affecting logging as a production process, the conditions which must be met by integrated mechanical methods, and the adaptability of the mechanical methods to the logging process from the stump to the final landing are necessary in setting up a program of work on mechanization. 5 figures. R.A.S.

WOOD TRANSPORTATION

KOROLEFF, A. Wire skidding comes of age. Pulp Paper Mag. Can. 55, no. 7: 161-2, 164 (June, 1954).

A brief description of the up-to-date procedure of wire skidding is presented; the principal limitations on the use of the method are its novelty and restricted dependence on suitable topographic features. 7 diagrams. R.A.S.

WOOD WASTE

SEIFERT, KARL. Resin extraction from forest and industrial pine wastes. Faserforsch. u. Textiltech. 5, no. 1: 27-31 (January, 1954).

Difficulties in accurately determining the resin (I) and turpentine (II) content of a specific raw material are emphasized. The percentages of (I) and (II) vary greatly with the age of the tree, the position of the wood in the bole and, in the case of stumpwood (III), the period during which the wood has been in the ground, the site, the surrounding soil, etc. Analyses for (I) and (II) are given (especially for [III] of *Pinus silvestris*). Heartwood was invariably higher in (I) and (II) than was the sapwood, and the extractives were generally much higher in the wood of old than in that of young trees.

The color of the extractives appears to be correlated with the presence of oxidized acids (IV). Thus the determination of the Fonrobert color value (V) serves as a measure of progressive oxidation of the wood extracts. The usual method for determining (IV) proved unreliable and the following technique is suggested. The weighed extract is dissolved in the minimum amount of acetone and treated with three volumes of ligroin, and the mixture evaporated to one third volume. The deposit formed on standing is freed from supernatant liquid and retreated in acetone and ligroin, dried at 120°C., and weighed. Time and temperature of extraction, the fineness of division of the wood, and the nature of the solvent all had marked effects on the yield of extract and on (V). (IV), (V), and the refractive index are given for extracts obtained with methanol, acetonitrile, ethanol, trichloroethylene, acetone, tetrachloroethylene, methyl acetate, chloroform, propyl ether, carbon tetrachloride, benzene, butyl ether, and benzine under carefully standardized conditions. In general, the higher was the percentage of (IV), the greater was (V). The most highly colored solutions were those of the alcohols and acetonitrile; the least colored were those of the hydrocarbons and butyl ether. Possible correlations between (V) of these solutions and the physical properties of the solvents are outlined. To obtain relatively pale rosins from (III) —i.e., low in (IV) and (V)—extraction with a suitable hydrocarbon (other than pinene) is recommended. This may be followed by an alcohol extraction, but the increase in yield is relatively low, and (IV) and (V) in the second extraction are invariably high. 12 tables, 1 figure, and 6 references.

L.E.W.

X-RAY RESEARCH

LOEB, L., and SEGAL, L. Preparation of cotton cellulose IV from cotton cellulose III. J. Polymer Sci. 14, no. 73: 121-3 (July, 1954).

Excellent conversion of cellulose III (from ethylamine treatment of cotton) to cellulose IV has been achieved by heating in glycerin. X-ray diffraction patterns are given, as well as x-ray spectrometer tracings of the effect of acid hydrolysis (very slight) on the lattice structure of the cellulose IV. 4 figures and 4 references.

K.W.,Jr.

WARWICKER, J. O., WELLARD, H. J., and WOODS, H. J. Structures of native and mercerized celluloses. Nature 174, no. 4420: 135-6 (July 17, 1954).

The first author suggests that the new equatorial reflexions observed by Sen and Roy (*cf.* B.I.P.C. 24: 580-1) in x-ray diagrams of native and mercerized celluloses may be spurious. The second author also suggests that the reflexions may arise from the use of radiation which was not strictly monochromatic. The third author has observed the consistent occurrence of an equatorial spacing of about 15 A. in x-ray photographs of jute fibers. For various reasons he does not consider this spurious. Unlike Sen and Roy, however, he has not observed this reflexion in undegraded ramie. 6 references.

K.W.,Jr.

Patent Section

Although the abstracts of the United States and Canadian patents are prepared from the patents themselves, the initial selection of the patents to be abstracted is made from the Patent Gazette *and the* Canadian Patent Office Record, *and, therefore, it is possible that the patent section will not contain all patents of potential interest to the industry. In so far as possible, an attempt will be made to indicate patents issued in both countries.*

The patent abstracts are listed under the various headings currently used for the abstracts of periodical articles.

Printed copies of United States patents can be obtained from the Commissioner of Patents, Washington, D.C.; the price is 25 cents per copy. Canadian patents up to and including December, 1948, are available only as manuscripts or photostatic copies, and an estimate of the cost of a patent should be obtained from the Commissioner of Patents, Ottawa, Canada, in advance of the order. Printed copies of Canadian patents are available at 50 cents per copy. Beginning with volume 21, the Canadian patents are abstracted from the complete specifications.

ADHESIVES

BAKER, CHESTER L., and SAMS, ROBERT H. Water-resistant silicate adhesives for the machine fabrication of paper board. U. S. patent 2,681,290. Filed Jan. 3, 1952. Issued June 15, 1954. 20 claims. Assigned to Philadelphia Quartz Company. [Cl. 106-79]

This is similar to Canadian patent 500,754 (March 16, 1954); *cf.* B.I.P.C. 24: 751. 5 figures. R.A.S.

SASS, OTTO, and LEMIRE, ELMER A. Flexible oilproof adhesive compositions. Canadian patent 504,009. Filed Oct. 20, 1944. Issued June 29, 1954. 3 claims. Assigned to The Patent and Licensing Corporation.

A laminating adhesive comprising animal glue, urea, sugar sirup, and water is applied at temperatures of 120-160°F. at the rate of 12-18 pounds/1000 sq. ft. This is the same as U. S. patent 2,414,274 (Jan. 14, 1947); *cf.* B.I.P.C. 17: 453. W.B.W.

ASBESTOS

LOCKHART, NATHAN J. Apparatus for separating airborne asbestos material. U. S. patent 2,679,933. Filed April 24, 1950. Issued June 1, 1954. 5 claims. [Cl. 209-139]

Raw asbestos is fed into the paddle device where impact from the paddles breaks the ore; the air blast created carries the fibers and waste-rock particles upward out of the crushing chamber. A suitable arrangement of baffles directs oversize particles back to the crushing chamber and fine rock debris to a conveyor system while the asbestos fibers are transported by the air currents to a collection chamber. 3 figures. W.B.W.

BARKERS AND BARKING

PRENTICE, CHARLES E. Log barking apparatus. U. S. patent 2,681,670. Filed May 21, 1951. Issued June 22, 1954. 1 claim. [Cl. 144-208]

The rotating cutter head of this barker is accurately positioned against the log by means of a shoe and a hydraulic cylinder which allows for fine adjustment of the cutter head. Tracks are provided for movement of the barker carriage parallel to the log during barking while the log is rotated on supporting rollers or other means. 5 figures. W.B.W.

WHITLOCK, WILLIAM R. Cutterhead for debarking logs. U. S. patent 2,679,870. Filed Jan. 28, 1952. Issued June 1, 1954. 4 claims. Assigned one third to Clark W. Adams. [Cl. 144-230]

The cutter head claimed is an improvement of that claimed in the original U. S. patent 2,591,751 (April 8, 1952; *cf.* B.I.P.C. 22: 704). The head is mounted flexibly on the rotating shaft so that it may compensate for bends in the log. Teeth on the head are readily replaceable and are securely locked in position by keys. 6 figures. W.B.W.

BOARD

FROST, ORCUTT W., and TOWER, GORDON E. Method of making hardboard. U. S. patent 2,680,995. Filed Dec. 1, 1950. Issued June 15, 1954. 16 claims. Assigned to Stimson Lumber Company. [Cl. 92-39]

The wood fiber used in the wet formation of this hardboard is treated in the slurry stage with a phenol-formaldehyde resin and wax emulsion at a controlled alkaline pH, held in a retention chest for a minimum of one hour, and then made acid with alum and sulfuric acid to precipitate the resin on and in the fiber. The wax emulsion is likewise broken by the acid pH causing the wax to coagulate on the fiber. A cylinder or Fourdrinier machine is employed to form this fiber into a wet lap, which is then passed between rolls where additional thermosetting resin and wax emulsions are applied as a surface treatment. The mat is then subjected to a single hot pressing for 11-17 minutes at 177-190°C., depending upon the thickness of the board and the density desired in the finished product. From 1 to 5% of resin based on the dry fiber is claimed to be within the range usually required. W.B.W.

WILLEY, GRANT S. Pressed decorative lignocellulosic products. Canadian patent 503,808. Filed Oct. 4, 1947. Issued June 22, 1954. 14 claims. Assigned to Canadian Gypsum Company Limited.

Hardboard with a decorative surface is made by pressing two blanks separated by a sheet of paper, canvas, or fabric which will not adhere to the lignocellulosic product and which imparts the desired surface to the finished boards. This is the same as U. S. patent 2,431,720 (Dec. 2, 1947); *cf.* B.I.P.C. 18: 338. W.B.W.

BOARD, FIREPROOF

BECHER, HUBERT L. Fire-resistant product from comminuted woody material, urea, or melamine-formaldehyde, chlorinated hydrocarbon resin, and hydrated alumina. U. S. patent 2,680,102. Filed July 3, 1952. Issued June 1, 1954. 7 claims. Assigned to Homasote Company. [Cl. 260-17.3]

Fire-resistant boards, sheets, and molded articles formed of comminuted wood (sawdust, groundwood, or wood chips) and thermosetting binders which still retain desirable mechanical strength are claimed. Best results are attained with 50-65% by weight of comminuted wood substance and 35-50% by weight

of a binder, comprising about 10-15% of a thermosetting amine resin, 5-10% of a chlorinated hydrocarbon resin (chlorinated paraffins), and 20-30% of hydrated alumina; the moisture content of the mixture should not exceed 20%. The sheeted mixture is subjected to a pressure of 250-350 p.s.i. at a temperature of about 280-320°F. R.A.S.

BOARD SPECIALTIES

CURRIE, GROVER C. Carrier for cylindrical objects. U. S. patent 2,680,556. Filed Aug. 15, 1950. Issued June 8, 1954. 1 claim. Assigned to Dacam Corporation. [Cl. 229-37]

An easily collapsible cardboard carrier for two parallel rows of cylindrical objects, such as cans of beer, fruit juice, etc., comprises integral side and end walls, a bottom formed by adhesively securing two flap extensions of the side walls, and a top and handle with finger apertures formed from two upper extensions of the side walls adhesively secured above the center of the carrier. 6 figures. R.A.S.

DUBIN, ARTHUR. Display carton. U. S. patent 2,679,926. Filed Jan. 15, 1953. Issued June 1, 1954. 2 claims. Assigned to Chemical Sundries Co. [Cl. 206-45.31]

A single blank of cardboard or similar material forms a carton and integral display card on which advertising matter or directions may be printed. The bottom wall extends a short distance past the end walls and one side wall and is adhesively joined to the display card which is hinged to that side wall. Flaps on the end closure walls fold outward and are adhesively secured to the bottom extensions. An open display window is cut in the top and sides of the carton. 11 figures. R.A.S.

FRUM, HERBERT D. Foldable cardboard beach table. U. S. patent 2,680,047. Filed June 1, 1951. Issued June 1, 1954. 3 claims [Cl. 311-35]

An inexpensive disposable foldable beach table sufficiently strong to support jugs of liquid, dishes, and foods is constructed from cardboard, corrugated board, etc. The table top has side and end flanges which fold downward and are provided with U-shaped slots at the corners to interlock with U-shaped keys from the legs; one or more central legs have prongs to engage slots in the center of the table top. 14 figures. R.A.S.

GOLDBERG, ARTHUR G. Automatic serving tray. U. S. patent 2,679,971. Filed March 22, 1952. Issued June 1, 1954. 11 claims. Assigned to Standard Box Co. [Cl. 229-28]

A serving tray of paperboard or other stiff sheet material for use in carrying food and beverages (e.g., from roadside stands) is provided with an extension of one side wall which folds back over about a third of the tray and has a flap adhesively secured to the bottom. The extension is supported on the end walls; suitable openings are cut to receive beverage cups. 7 figures. R.A.S.

GUYER, REYNOLDS. Dome top carrier carton. U. S. patent 2,681,143. Filed Feb. 17, 1950. Issued June 15, 1954. 7 claims. Assigned to Waldorf Paper Products Company. [Cl. 206-65]

Six cans of beer, fruit juice, etc. are carried in a horizontal position in the paperboard carrier claimed. Curved fold lines are provided along two sides of the top so that when the carton is picked up by inserting the fingers in the cut-out handhole, a dome-shaped top is effected. 4 figures. R.A.S.

GUYER, REYNOLDS. Tray structure. U. S. patent 2,681,173. Filed Feb. 14, 1949. Issued June 15, 1954. 4 claims. Assigned to Waldorf Paper Products Company. [Cl. 229-34]

Double side and end walls are provided on a paperboard tray for fruit, vegetables, and other commodities. The side wall is made double by an extension which is folded outward; flaps on the ends of this extension are glued to the inside of the end wall so that the tray may be kept in a folded position and erected by folding the end-wall extension inward, over the flaps, until notches interlock at the lower corners. 7 figures. R.A.S.

MADDEN, WILSON H. Frozen confection sandwich container. U. S. patent 2,680,557. Filed Feb. 9, 1950. Issued June 8, 1954. 2 claims. [Cl. 229-38]

An open-end paperboard container for frozen confection sandwiches is provided with side walls which are folded at the center and held indented by specially cut flaps at one end; this arrangement holds the crackers apart so that ice cream can easily be flowed into the center. A bottom closure flap is included; slits cut at the corners permit the peeling down of the side walls for eating the sandwich. 5 figures. R.A.S.

SAIDEL, WILLIAM R. Folding carton. U. S. patent 2,679,970. Filed June 17, 1949. Issued June 1, 1954. 2 claims. [Cl. 229-27]

In an open-top tray with crosswise partitions cut from a single sheet of paperboard, the end walls are held in place and the bottom closure is effected by interlocking tongues and slits. Wings attached to the side walls hold the partitions in vertical position; a transparent overwrap is generally used in conjunction with the carton. 7 figures. R.A.S.

SANFORD, ROY S. Container. U. S. patent 2,681,172. Filed June 2, 1949. Issued June 15, 1954. 10 claims. Assigned to The Autoyre Company, Incorporated. [Cl. 229-30]

A skeleton-structure tray is cut from a flat blank of paperboard, sheet metal, or the like; tongues which form the sides are cut and folded up from the bottom, and a separate strip connects the tongues and defines the upper edge of the side wall. The end walls are extensions of the bottom. 8 figures. R.A.S.

YOUNG, LEWIS D. Display box. U. S. patent 2,680,512. Filed June 2, 1951. Issued June 8, 1954. 1 claim. Assigned to Douglas Young, Inc. [Cl. 206-45.13]

A display box, which may be lined with a textile material, comprises identical bottom and cover halves joined by a metal hinge. Upon raising the cover 90°, a loosely fitting tray in the bottom section is raised to an inclined position by a lever of relatively stiff material attached to the cover. 3 figures. R.A.S.

YOUNG, LEWIS D. Display box. U. S. patent 2,681,141. Filed June 26, 1951. Issued June 15, 1954. 7 claims. Assigned to Douglas Young, Inc. [Cl. 206-45.18]

A display box easily loaded by machine and comprising two sections which slidably fit together is claimed; the outer section is an open-top paperboard tray with a decorative cut-out in the side wall. The inner sleeve is constructed with sides and top of a transparent material stapled to the short flaps of the paperboard bottom; the flap on one end hooks over the end of the outer tray to hold the box in an inclined position for display. 3 figures. R.A.S.

YOUNGREN, MILTON D. Animated greeting card. U. S. patent 2,680,328. Filed March 17, 1952. Issued June 8, 1954. 4 claims. Assigned to Hall Brothers, Inc. [Cl. 46-37]

An animated greeting card (made from cardboard, etc.) is effected by means of a back member which bows outwardly, opening up a space to accommodate a swing movement of the stops and free ends of the moving parts of the character drawn on the front member. 4 figures. R.A.S.

CELLULOSE ETHERS

GRASSIE, VERNON R., and WALLIS, CALVIN R. Alkali cellulose preparation. U. S. patent 2,680,737. Filed May 17, 1951. Issued June 8, 1954. 7 claims. Assigned to Hercules Powder Company. [Cl. 260-233]

Comminuted cellulose from wood pulp sufficiently small to pass the openings of a 35-mesh screen is slurried in an aqueous sodium hydroxide solution containing isopropanol to produce a uniform alkali cellulose. W.B.W.

GUTHRIE, JOHN D., CHANCE, LEON H., and HOFFPAUIR, CARROLL L. Process for producing textile cellulose sulfo-ethyl ether cation-exchange material. U. S. patent 2,681,846. Filed Jan. 16, 1951. Issued June 22, 1954. 1 claim. Assigned to the United States of America as represented by the Secretary of Agriculture. [Cl. 8-120] *cf.* B.I.P.C. 21 : 91.

The invention covers a novel process for the manufacture of fibrous 2-sulfoalkyl ethers of cellulose with cation-exchange properties. A cellulosic textile (cotton fabric) (I) containing reactive hydroxyl groups is impregnated with an alkali metal hydroxide of mercerizing strength which contains from 5 to 15% of a sulfoethylating agent (consisting of 2-chloroethanesulfonic acid, ethionic acid, and ethylenesulfonic acid) by contacting (I) with the alkaline solution sufficiently long to wet all the fibers, removing (I) from contact with any liquid in excess of the amount entrained, heating (I) at about 50°C. for 1-30 minutes, and washing free of alkali. E.S.

LAUGHLIN, KENNETH C. Preparation of alkali cellulose. U. S. patent 2,680,738. Filed April 11, 1952. Issued June 8, 1954. 6 claims. Assigned to Hercules Powder Company. [Cl. 260-233]

Comminuted cellulose made by passing cotton, cotton linters, wood pulp, or the like through a knife mill to avoid fibrillation is slurried with isopropanol, then mixed with sodium hydroxide solution, and agitated in kettles at less than 30°C. for 3-15 minutes to produce a uniform alkali cellulose. W.B.W.

COLLOIDS

ILER, RALPH K. Stabilization of silica sols with lithium hydroxide and product. U. S. patent 2,668,149. Filed Dec. 3, 1951.

Issued Feb. 2, 1954. 8 claims. Assigned to E. I. du Pont de Nemours and Company. [Cl. 252-313]

A sol with alkaline reaction and especially useful because of its compatibility with organic materials is valuable in the treatment of paper, leather, or textiles where sodium ions would be detrimental. The deionized silica sol is mixed with lithium hydroxide and immediately forms a gel which later disperses to a fluid sol. 4 figures. W.B.W.

CONTINUOUS COOKING PROCESS

OBENSHAIN, DAVID N. Charging and discharging mechanism for use in continuous cooking of chips in the manufacture of pulp. U. S. patent 2,680,683. Filed Dec. 6, 1951. Issued June 8, 1954. 11 claims. Assigned to West Virginia Pulp and Paper Company. [Cl. 92-7]

A disk-type valve for metering chips into a digester and removing cooked chips from the digester comprises a rotating disk with chambers in spaced alignment around the center. This disk operates between sealing surfaces and is fed by a metering device which prevents complete filling of the pockets with consequent wear on the sealing surfaces. As the disk is rotated, the chambers come into alignment with ports in the sealing plates where chips are metered into the pockets, discharged into the digester, etc. Internal conduits in the valve assembly are provided for balancing the pressures within the digester and the valve, thus reducing friction. 13 figures. W.B.W.

OBENSHAIN, DAVID N. Strainer mechanism for use in continuous cooking of chips in the manufacture of pulp. U. S. patent 2,680,684. Filed Dec. 6, 1951. Issued June 8, 1954. 8 claims. Assigned to West Virginia Pulp and Paper Company. [Cl. 92-7]

In a digester for the continuous cooking of wood chips, the funnel-shaped bottom is made up of a series of overlapped plates in concentric rings; the plates are slightly separated to allow liquor removal from the digester between the plates. To prevent clogging, an arrangement is made for backwashing this strainer by segments; the backwashing also serves to aid movement of the cooked chips toward the discharge valve. 5 figures. W.B.W.

DIGESTERS—FILLING DEVICES

OBENSHAIN, DAVID N. Continuous digester chip level indicator. U. S. patent 2,680,298. Filed Dec. 6, 1951. Issued June 8, 1954. 9 claims. Assigned to West Virginia Pulp and Paper Company. [Cl. 33-126]

A feeler element is connected to a rocking arm periodically actuated by a motor. The mechanical movement of the arm is translated through a linkage of levers to change an electrical resistance. The servomechanism controlled by the resistance and connected to the chip-filling mechanism automatically stops the filling operation when the proper level is attained. 9 figures. W.B.W.

ELECTRIC PRECIPITATORS

DAVIS, ALBERT S., JR. Wet bottom precipitator. U. S. patent 2,682,314. Filed Oct. 30, 1952. Issued June 29, 1954. 3 claims. Assigned to Research Corporation. [Cl. 183-7]

An electrical precipitator used in conjunction with a recovery furnace comprises a pool of weak black liquor in a sump at the bottom of the precipitator. Constant agitation is provided in the pool to aid in dissolving the solids which fall from the collecting electrodes; the fortified liquor is withdrawn and replaced by weak liquor at a rate determined by the addition of solids. 4 figures. W.B.W.

FOLDING BOXES

BERGSTEIN, ROBERT M. Hollow wall box. U. S. patent 2,681,174. Filed Feb. 4, 1952. Issued June 15, 1954. 3 claims. [Cl. 229-38]

A collapsible paperboard carton comprises double top panels cut to form a window; the flaps from this window fold down to form the double hollow wall construction of the side and end walls of the box. 10 figures. R.A.S.

TYRSECK, WALTER J. Cartons. Canadian patent 504,018. Filed March 21, 1951. Issued June 29, 1954. 12 claims. Assigned to Robertson Paper Box Company Incorporated.

A folding paper box cut from a flat blank forms a series of connected panels which comprise a complete outer sleeve and an inner sleeve for cushioning an article, such as a bottle. Various additional panels for dividing the carton into compartments and panels and methods of gluing to give sufficient support to the inner sleeve are claimed. 11 figures. R.A.S.

GLUE AND GELATINE

WHITE, THOMAS A. Manufacture of animal glue jellies. Canadian patent 503,695. Filed May 22, 1946. Issued June 15, 1954. 7 claims. Assigned to National Starch Products Inc.

Resinification of flexible animal glues during storage is prevented by the inclusion of a reducing sugar to act as a plasticizing agent and an ammonium compound as an inhibitor. W.B.W.

INTERIOR PACKING

WELSHENBACH, CHARLES D., and GAGEN, THOMAS H. Article positioning and cushioning device for use in shipping containers. U. S. patent 2,681,733. Filed Nov. 10, 1950. Issued June 22, 1954. 5 claims. Assigned to The Hinde & Dauch Paper Company. [Cl. 206-62]

A device for positioning and cushioning fragile panels such as plate glass, mirrors, etc. in a shipping container is cut from a strip of multi-ply corrugated paperboard the same width as the depth of the container. Two identical sections on either end of the strip are folded back into an inverted V and held by a locking tongue from the center of the strip. The device is positioned at the corners or along the sides of the container. 7 figures. R.A.S.

LIGNIN

ADLER, ERICH, and HÄGGLUND, ERIK K. M. Method of producing water-soluble products from black liquor lignin. U. S. patent 2,680,113. Filed Dec. 19, 1950. Issued June 1, 1954. 19 claims. Assigned to Svenska Cellulosaföreningens Centrallaboratorium. [Cl. 260-124]

Lignin in black liquors from alkaline pulping processes is solubilized by treatment with an oxidizing gas, then with a sulfonating agent and an aldehyde at temperatures of 100-160°C. This lignin is claimed to be especially suitable for tanning leathers. W.B.W.

MACHINERY—CHIPPERS

JOHNSON, CHARLES A. Wood chipper. Canadian patent 503,762. Filed May 26, 1950. Issued June 22, 1954. 5 claims.

This is identical with U. S. patent 2,655,319 (Oct. 13, 1953); *cf.* B.I.P.C. 24: 330. 13 figures. W.B.W.

MACHINERY—CONVERTING MACHINERY

BELCHER, DANIEL, WILLIAMS, RUSSELL J., and HEIMOS, MILTON J. Manufacture of window bags. Canadian patent 503,547. Filed June 12, 1950. Issued June 8, 1954. 7 claims. Assigned to Bemis Bro. Bag Company.

This is the same as U. S. patent 2,662,578 (Dec. 15, 1953); *cf.* B.I.P.C. 24: 499. 16 figures. R.A.S.

BIVANS, ELBERT L. Boxmaking machine. U. S. patent 2,682,209. Filed Jan. 23, 1950. Issued June 29, 1954. 14 claims. Assigned to E. L. Bivans, Inc. [Cl. 93-49]

Flat-folded paperboard boxes are fed from the bottom of a magazine to the erecting mechanism which opens the carton and is then acted upon by side and end tuckers which tuck the bottom closure flaps into place. Entrance of the following collapsed box into the erecting mechanism ejects the erected box. 15 figures. W.B.W.

BIVANS, ELBERT L. Boxmaking machine. U. S. patent 2,682,210. Filed Feb. 5, 1951. Issued June 29, 1954. 13 claims. Assigned to E. L. Bivans, Inc. [Cl. 93-49]

This is an improvement on U. S. patent 2,682,209 (June 29, 1954; *cf.* abstract above), wherein the tucking mechanism for the bottom flap is capable of handling more complicated box structures. 19 figures. W.B.W.

FITCHETT, THOMAS S. Creasing and slotting machine. U. S. patent 2,681,105. Filed May 6, 1949. Issued June 15, 1954. 9 claims. [Cl. 164-60]

The creasing or slitting heads of the machine are clamped by a lever to the supporting rails, and the respective shafts act only as a driving means for the heads. Rapidity of adjustment for blanks of various sizes and boards of various thicknesses is claimed for the device. 23 figures. W.B.W.

MONROE, CHARLES Z., and RAYMOND, NORTON G. Carton converting machine. U. S. patent 2,682,208. Filed April 15, 1948. Issued June 29, 1954. 20 claims. Assigned to Ex-Cell-O Corporation. [Cl. 93-36]

A carton-blank machine is claimed in which the paperboard or similar material is supplied to the machine in roll form, and the material printed, scored, and cut into blanks. Scoring and cutting rolls are operated in registra-

tion with the printed material on the web. Scrap is stripped from the blanks and the completed blanks are delivered to a station for removal from the machine. 29 figures. W.B.W.

RYNISH, LOUIS J. Machine for making and assembling spools. U. S. patent 2,682,207. Filed Sept. 7, 1951. Issued June 29, 1954. 9 claims. Assigned to Central Spool and Tube Company. [Cl. 93-1]

Paper or cardboard spools used in the ribbon industry are assembled in this machine which is supplied with the cores and end disks, applies adhesive to the ends of the core, and positions the disks on either end while the assembly is advanced on a slotted conveyor wheel. 14 figures. W.B.W.

MACHINERY—CORRUGATING MACHINE

BROWN, PAUL. Corrugated paper machine. U. S. patent 2,680,996. Filed Nov. 3, 1951. Issued June 15, 1954. 12 claims. Assigned to Packaging Materials Corp. [Cl. 92-39]

In a machine for producing corrugated board, the pulp slurry is flowed onto a corrugated forming cylinder, the pulp drawn into the grooves by vacuum, and then compressed by rolls which force the pulp into the grooves and squeeze water from the pulp. The molded sheet is removed from the forming cylinder and, after drying, is either used in that form for packing or a single or double backing is applied for use in containers. The straight-line operation by which this board is produced is claimed to make production of such board faster and less expensive than that produced by conventional methods. 15 figures. W.B.W.

MACHINERY—CUTTERS

BARNEY, FREEMAN, and LEE, JAMES W. Paper cutter. U. S. patent 2,681,104. Filed Oct. 9, 1950. Issued June 15, 1954. 2 claims. Assigned to The Challenge Machinery Company. [Cl. 164-54]

The knife and the clamping bar on a sheet cutter are linked together through a hydraulic system which applies clamping pressure on the stacked sheets a moment before, and releases pressure a moment after, the knife has cleared the stack in its upward travel. The knife edge is thus always guarded by the movement of the clamping bar making it impossible for the operator to come into contact with the knife. 11 figures. W.B.W.

MACHINERY—DELAMINATING MACHINE

FRIDOLPH, JOHN S. Delaminating composite web. U. S. patent 2,679,986. Filed June 19, 1950. Issued June 1, 1954. 3 claims. Assigned to Oxford Corporation. [Cl. 242-66]

A plastic web and the backing sheet of paper, fabric, or the like used in the formation of the plastic web are stripped apart by this machine and wound on separate rolls. Tension on the two rewind rolls is individually adjustable to prevent stretching of the plastic and to insure a smooth roll of paper for re-use. Slitting or trimming of either or both webs may be incorporated in the device. 4 figures. W.B.W.

MACHINERY—EMBOSSING MACHINERY

JACOBS, ROBERT J. Paper embossing machinery. U. S. patent

2,681,611. Filed Jan. 26, 1951. Issued June 22, 1954. 5 claims. Assigned to The Black-Clawson Company. [Cl. 101-23]

The rolls of this embosser are supported in the vertical slot between frame members, with the lower roll urged upward by hydraulic cylinders at either end. When pressure is released, the bearing blocks are lowered against bumpers made of rubber or other resilient material. These bumpers are so mounted that the teeth of the drive gears remain meshed, thus ensuring that the rolls return to alignment when pressure is reapplied. Mounting of two or more sets of rolls on a single base is claimed to offer advantages in this design. 18 figures. W.B.W.

MACHINERY—FELT CONDITIONERS

HUBER, DUDLEY A. Apparatus for continuous chemical cleaning and conditioning of paper mill wet felts. U. S. patent 2,680,997. Filed May 8, 1953. Issued June 15, 1954. 1 claim. [Cl. 92-50]

A conditioning system for paper-machine wet felts incorporates a metering pump which conveys a conditioning agent (Feltex) containing a detergent, a bactericide and, if desired, a dispersing agent into the shower water used at 40-60 p.s.i. to condition the felts continuously. 1 figure. W.B.W.

MACHINERY—FOLDING MACHINE

MCMILLAN, ARCHIE, BEEKER, BERNIE, and MICKEY, ARTHUR C. Bellows folding machine. U. S. patent 2,680,998. Filed Jan. 24, 1950. Issued June 15, 1954. 20 claims. Assigned to General Motors Corporation. [Cl. 93-77]

Paper or other sheet material fed in a continuous strip to this device is formed into a tube and the joint heat sealed, after which the tube is passed over a mandrel and engaged by four pleat formers on endless chains which engage the sides of the tube and fold opposed pleats first on the top and bottom and then on each side of the tube. The accordion-pleated tube is octagonal in cross section. 12 figures. W.B.W.

MACHINERY—HEAD BOX

BENNETT, WESTON T. Headbox for paper machine. Canadian patent 503,957. Filed April 27, 1950. Issued June 29, 1954. 16 claims. Assigned to Canadian International Paper Company.

The supply pipe of this headbox is connected to a header provided with a honeycomb section which confines the stock and reduces the turbulence. The pipes of said section are inclined at a slight upward angle and deliver the stock to a relatively long horizontal channel under air pressure, where the stock is accelerated to the speed of the wire in a laminar flow condition. Deflocculating rolls just ahead of the slice may be incorporated in the design, if desirable. 8 figures. W.B.W.

MACHINERY—PACKAGING MACHINERY

BANKS, CHARLES T. Packaging machine. Canadian patent 503,445. Filed May 19, 1948. Issued June 1, 1954. 23 claims. Assigned to International Cellucotton Products Company.

A machine for conveying compressible articles (e.g., sanitary napkins)

directly into boxes is claimed. This is the same as U. S. patent 2,631,767 (March 17, 1953); *cf.* B.I.P.C. 23: 604. 17 figures. W.B.W.

BROOK, LEONARD. Wrapping machine. U. S. patent 2,679,765. Filed April 21, 1952. Issued June 1, 1954. 5 claims. Assigned to The Forgrove Machinery Company Limited. [Cl. 74-470]

A spring for the protection of the driving linkage in case of jamming in this wrapping machine is mounted in a manner to reduce the mechanical advantage of the spring as compression increases, thus making possible the use of a strong spring and, at the same time, protecting the machine. 3 figures. W.B.W.

KUENN, WILLIAM W., and JONES, ELMER F. Method of packaging insulating strips. U. S. patent 2,681,702. Filed March 22, 1949. Issued June 22, 1954. 7 claims. Assigned to Owens-Corning Fiberglas Corporation. [Cl. 164-17]

A process and apparatus for assembling and packaging insulating batts or units in a manner whereby the components may be readily separated from the package is claimed. As the continuous web of backing sheet, group of batt sections, and packaging sheet (e.g., kraft paper) moves along a conveyor, one device perforates the packaging sheet in the spaces adjacent insulating sections; another device forms rows of perforations lengthwise, which are adjustable for the different widths required. The web is rolled into a compact package and secured by a strip of adhesive-coated paper. 12 figures. R.A.S.

PRINCE, CLARENCE F. Cracker wrapping machine. U. S. patent 2,680,336. Filed Dec. 28, 1950. Issued June 8, 1954. 8 claims. Assigned to Package Machinery Company. [Cl. 53-131]

Crackers or similar fragile articles in stacked relation are removed from a conveyor, the stack is aligned by guide bars, and a wrapper sheet draped over the stack as it is elevated to the wrapping channel. The tucking and folding elements are resiliently mounted to allow for irregularities in size and shape of the units. A heat-sealing channel completes the packaging operation. 16 figures. W.B.W.

VOGT, CLARENCE W. Apparatus for and method of chaining enwrapments. U. S. patent 2,682,206. Filed Oct. 28, 1948. Issued June 29, 1954. 5 claims. [Cl. 93-1]

Bags are connected in a chain for passage through the filling machinery; the trailing end of one bag is lifted and the adhesive-coated flap of the following bag slipped underneath in timed sequence with a heated sealing element which makes the temporary seal between bags. After filling, the bags are separated into individual units. 19 figures. W.B.W.

WAY, HARVEY H. Roll wrapping apparatus. U. S. patent 2,681,534. Filed April 23, 1951. Issued June 22, 1954. 37 claims. Assigned to Powell River Company Limited. [Cl. 53-98]

A device for wrapping rolls of paper or similar webs over a wide range of lengths and diameters is claimed. A length of wrapping paper is applied by rotating the roll a predetermined number of times for the required number of layers, then the roll is transferred to the next station where crimper plates move toward the roll and press the protruding end of the wrapper flat against

the ends of the roll. End caps with the same diameter as the roll are adhesively coated and pressed against the ends to complete the wrapping. 10 figures. W.B.W.

MACHINERY—PRINTING MACHINE

REIMANN, KURT P. Means for embossing and printing. U. S. patent 2,681,612. Filed Jan. 31, 1951. Issued June 22, 1954. 1 claim. [Cl. 101-25]

A method of printing and embossing a continuous roll of flexible material in one operation is made possible through the use of a steam-heated cylinder, an endless screen on which the transferable designs or patterns are woven or attached, rotated around the cylinder and several idler rollers, and an endless blanket rotatably superimposed on a portion of the screen, allowing for passage of the web between blanket and screen. The points of the design are sufficient for the molding of the flexible material and/or the transfer of the design in ink. 3 figures. R.A.S.

MACHINERY—PULPERS

BAXTER, JOSEPH, JR. Paper machinery. U. S. patent 2,681,598. Filed June 4, 1951. Issued June 22, 1954. 7 claims. Assigned to The Black-Clawson Company. [Cl. 92-26]

The impeller for this pulping apparatus is generally dish-shaped and made up of stepped annular rings coated with abrasive particles, each series of rings inclined toward the center so that pulp traveling across the impeller face is constantly brought into contact with new surfaces. Upstanding vanes on the face of the impeller cause a pumping action which forces circulation of stock within the tub of the pulper. 10 figures. W.B.W.

MACHINERY—REFINERS

SKARDAL, KARL A. Refiner for fiber suspensions and pulp. U. S. patent 2,679,788. Filed July 1, 1953. Issued June 1, 1954. 4 claims. [Cl. 92-20]

Toboggan-shaped, perforated refiner elements are pivotally attached to a shaft so that the rotation of the shaft forces the elements outward against the inner walls of the perforated drum. Pulp suspensions introduced into the refiner are dewatered when entering between the perforated element and the drum wall, and subsequent rubbing by the plates produces the refining action. 2 figures. W.B.W.

MACHINERY—SCREENS

VINCENT, BERTRAM J. Screen plate for papermaking machines. U. S. patent 2,682,205. Filed June 28, 1949. Issued June 29, 1954. 5 claims. [Cl. 92-31]

Slotted screen plates of stainless steel are formed without sharp-angled bends which cause cracking of such plates. Stiffening ribs are included between each pair of sections to strengthen the plate further. 9 figures. W.B.W.

MACHINERY—SHEET-FEEDING MECHANISM

ROSE, ALFRED G., and PAGE, JAMES. Suction feeding of sheets, cards, collapsed cartons, and the like. U. S. patent 2,681,803. Filed

Sept. 6, 1950. Issued June 22, 1954. 3 claims. Assigned to Rose Brothers (Gainsborough) Limited. [Cl. 271-26]

A suction feed for cartons comprises a suction head provided with a valve which is operated in timed relation with the carrying arm to activate the valve as the head and the carton meet. Thus the suction line is evacuated against the closed valve before the seizing action takes place, with the result that substantially the full suction force is available as soon as the valve is opened. 3 figures. R.A.S.

MACHINERY—SLITTERS AND WINDERS

KOHLER, JOHN B. Method for winding rolls. Canadian patent 503,632. Filed Feb. 22, 1945. Issued June 15, 1954. 9 claims.

As the core on which a new roll of paper, fabric, or similar material is to be wound is brought into place, a knife or other severing means and an adhesive-supplying jet are synchronized to transfer the web to the new core without interrupting the flow of material. A clutch mechanism in the reel drive allows the new core to be brought up to winding speed very rapidly while keeping proper tension on the web. 20 figures. W.B.W.

MACHINERY—VORTEX-TYPE DIRT SEPARATOR

SCHROCK, RAYMOND L. Paper machinery. U. S. patent 2,681,610. Filed July 27, 1951. Issued June 22, 1954. 5 claims. Assigned to The Black-Clawson Company. [Cl. 100-147]

Continuous dirt removal from a centrifugal pulp cleaning apparatus such as that described by Staege and Gibson in U. S. patent 2,645,346 (July 14, 1953; *cf.* B.I.P.C. 24: 76) is facilitated by the counterbalanced door construction claimed. As the grit and other solid material are collected at the bottom of the separator, the screw conveyor forces them against the door which closes the end of the chamber. Suspension of this door keeps the axis of the conical nose piece on the inside of the door parallel with the axis of the screw at all times, thus making a more effective seal. 5 figures. W.B.W.

MACHINERY—WIRES

BAXTER, JOSEPH, JR., HERRICK, WALLACE D., and JAVID, FARHANG. Wire stringing device for paper machinery. U. S. patent 2,681,721. Filed April 25, 1952. Issued June 22, 1954. 12 claims. Assigned to The Black-Clawson Company. [Cl. 198-1]

The forming wire for a Fourdrinier machine is unreeled and supported on a device which is opened from the collapsed position in the aisle adjacent the wet end of the machine. Supporting members carrying the wire are projected sideways from the device to deposit the wire in place on the machine, whereupon the supporting members are withdrawn. 26 figures. W.B.W.

MATERIALS HANDLING

BROWN, CHARLES K., JR., and SMITH, GENE C. Box loading and conveying machine. U. S. patent 2,681,171. Filed Nov. 30, 1951. Issued June 15, 1954. 4 claims. Assigned to Robert E. Johnson. [Cl. 226-14]

Filled containers such as paper milk bottles are assembled in groups of predetermined size, lifted as a group by a vacuum head, and deposited in a

carton positioned to receive the containers. As each carton is filled, it is moved by gravity down a chute and replaced by an empty carton. One or more levels of containers may be loaded into a carton as desired. 11 figures. W.B.W.

MERCERIZATION PROCESS

PATTON, FRANCIS M., JR. Method of preparing alkali cellulose. U. S. patent 2,681,908. Filed Sept. 25, 1950. Issued June 22, 1954. 3 claims. Assigned to American Enka Corporation. [Cl. 260-233]

Sheets of cellulose in the soaking vat for treatment with sodium hydroxide are supported at the upper corners by clamping means to prevent slumping of the sheet as the caustic solution is introduced to the bottom of the vat with resulting nonuniform penetration of the outer and inner sheets. After the caustic has completely submerged the sheets, the clamps are released. A more uniform caustic soaking of the sheets in the bath is claimed with improved quality of the viscose manufactured therefrom. W.B.W.

MOLDED PULP ARTICLES

PALESE, RICHARD A. M., and YOUNG, SERENUS H. A. Molding pulp and impregnating the product. U. S. patent 2,681,599. Filed Jan. 27, 1948. Issued June 22, 1954. 4 claims. Assigned to American Cyanamid Company. [Cl. 92-55]

Molded pulp articles (chair seats, table tops, etc.) made from kraft, sulfite, or rag pulp, to which may be added caroa, manila, jute, or bagasse pulps and a trimethylol melamine colloid, are claimed. The molded preform is oven dried and impregnated with a polyester under such conditions as to attain the degree of impregnation required, whereupon the resin is polymerized in an oven-curing process. This impregnated preform is subjected to a final molding process at 75-100 p.s.i. and temperatures from 275-300°F. for 1.5 to 3.5 minutes, depending upon the size and thickness of the sample. Articles so produced have a smooth surface and may be finished with either drying lacquers or baking enamels. W.B.W.

NIP AREA

MESSINGER, WILLIAM, and VOLKMANN, JOSEPH. Remote-control nip adjustment and sequence of nip closure control. U. S. patent 2,674,222. Filed June 6, 1950. Issued April 6, 1954. 30 claims. Assigned to St. Regis Paper Company. [Cl. 118-10]

The control circuit for moving rolls into a predetermined position in a device such as a paper coater is claimed. Nips may be closed in any desired sequence and the final adjustment performed after the closure; provision is also made for automatic opening in the event of power or other failure. 13 figures. W.B.W.

PACKAGING

SAX, MAX. Method of making packages. U. S. patent 2,682,138. Filed March 22, 1952. Issued June 29, 1954. 6 claims. Assigned to Container Mfg. Co. [Cl. 53-11]

Packages for medicinal pills or the like are made by laminating a number of layers of cardboard, the punched holes in each layer registering to provide a series of pockets of the correct diameter and thickness to receive the pill. The back of the opening is closed with a foil membrane, and the face is

covered with a transparent film which likewise acts to position the pill and prevent shifting within the cell. 15 figures. W.B.W.

PACKAGING—OPENERS

MAI, GEORGE W. Opening device for cartons. U. S. patent 2,680,558. Filed Jan. 10, 1951. Issued June 8, 1954. 1 claim. Assigned to Gaylord Container Corporation. [Cl. 229-51]

The sealing flap for a carton such as that used for ice cream is provided with a series of closely spaced slits to provide a controlled tear edge when the sealing flap is torn from the carton. Tearing is thus confined to this line of perforations, and contamination of the product is avoided. 6 figures. W.B.W.

PAPER—COATED

FRIDOLPH, JOHN S. Paper coating machine. U. S. patent 2,681,636. Filed Jan. 15, 1951. Issued June 22, 1954. 11 claims. Assigned to The Black-Clawson Company. [Cl. 118-249]

The coating composition in this device is carried upwardly by the fountain roll to the metering nip, thus forming an inverted fountain from which the coating is metered to the web. An adjustable doctor blade removes excess coating composition from the metering roll. Bearing blocks for the coating rolls are mounted on sliding wedges for accurate adjustment of the nip between rolls to predetermined settings. 19 figures. W.B.W.

MONTGOMERIE, JOHN A. Coating of paper. Canadian patent 503,812. Filed March 19, 1946. Issued June 22, 1954. 7 claims. Assigned to Chemical Manufacturing Company.

A paper-coating composition is made by mixing a vegetable resin in an alkaline casein solution with the addition of china clay. This is the same as U. S. patent 2,566,529 (Sept. 4, 1951); *cf.* B.I.P.C. 22: 153. W.B.W.

PAPER—FILLERS

MARRONE, JOHN C. Method of forming paper. U. S. patent 2,680,072. Filed Sept. 29, 1949. Issued June 1, 1954. 1 claim. Assigned to A. M. Meincke & Son, Inc. [Cl. 92-21]

A cold-swelling starch in which the pH is reduced to 5.2-6.5 prior to heat treatment used in a composition with calcium sulfate or other inert filler is claimed not to reduce the brightness of paper pulp in which it is used. W.B.W.

PAPER—SHEET FORMATION

HUEBNER, WILLIAM C. Method for making sheet or web material. U. S. patent 2,680,079. Filed April 4, 1951. Issued June 1, 1954. 1 claim. Assigned to The Huebner Company. [Cl. 117-93]

A method and machine for making a continuous web from deposits of compositions in liquid, semiliquid, or mobile liquid particle form comprise maintaining an electromagnetic field of force throughout a zone extending the width of the web to be produced from fibrouslike materials which are electrically chargeable and ionizable. The electromagnetic field is claimed to ionize the material and create a field of force of such strength as to effect complete migration of the composition across the atmospheric gap to form a continuous deposit upon the wire mesh or felt support, which is then moved

through a drying chamber to remove the fluids from the formed web. Deposition of pulp fibers from suspensions of 60-70% consistency is claimed possible with this process. 8 figures. R.A.S.

PAPER SIZING

DAVIDSON, JOHN B., and SANTELLI, THOMAS R. Method of sizing paper. U. S. patent 2,680,073. Filed Jan. 10, 1951. Issued June 1, 1954. 6 claims. Assigned to Allied Chemical & Dye Corporation. [Cl. 92-21]

A method of beater sizing pulp for papermaking is claimed wherein an organosilane is added to the beaten pulp in conjunction with a small amount of alum. Paper formed from the suspension is water repellent. W.B.W.

PAPER SPECIALTIES

BOSTWICK, WALLACE L., and TERRY, SAMUEL M. Carrier-backed decorative material. U. S. patent 2,670,555. Filed Nov. 2, 1950. Issued March 2, 1954. 8 claims. Assigned to The United States Playing Card Company and National Publishing Company. [Cl. 41-37]

A carrier or backing sheet of paper, cellophane, or the like is coated with a release material, a layer of decorative metal (e.g., by vacuum evaporation), and a heat-activated layer of polyamide adhesive mixed with 25-70% nitrocellulose. In use, the adhesive layer is placed against the edge of books, playing cards, leather, or the like to be decorated, heat and pressure are applied, and the backing is stripped off. 2 figures. W.B.W.

CHRISTIANSON, CONRAD J. Water reducible fire-retardant coating compositions. U. S. patent 2,681,326. Filed Aug. 26, 1950. Issued June 15, 1954. 12 claims. Assigned to The Sherwin-Williams Company. [Cl. 260-39]

A fire-retardant coating composition for application to objects of paper, cloth, or other construction materials capable of flame propagation is water-reducible, stable for several weeks, and dries to a smooth film. The composition consists of 1-10% of an alkaline-catalyzed amide-aldehyde resin, 5-35% of an acidic ammonium phosphate-catalyzed condensation product of an aldehyde and a second amide selected from the group of cyanamide, dicyandiamide, and guanidine, 35-55% of an inorganic ammonium salt capable of releasing ammonia under flame conditions, 7-12% of a monomeric saturated aliphatic compound consisting of dicarboxylic acids, hydroxy dicarboxylic acid, and their salts, and a blend of inorganic pigments comprising china clay and zinc oxide. R.A.S.

DAVID, ANDREW M. Double window envelope. U. S. patent 2,681,175. Filed June 17, 1952. Issued June 15, 1954. 1 claim. [Cl. 229-75]

A combined original and return-envelope blank is provided with two sets of gummed flaps and two window sections, each showing one address, so that the same envelope can be returned by refolding the blank. 7 figures. R.A.S.

DOYLE, JAMES F., and ONASCH, PAUL L. Method of making crinkled laminated material. U. S. patent 2,679,887. Filed July 22,

1949. Issued June 1, 1954. 6 claims. Assigned to Arkell Safety Bag Company. [Cl. 154-33.05]

Paper which has been previously coated with polyethylene or laminated with a polyethylene film is crinkled or creped by first passing the material through a tank filled with water which has been heated to a temperature slightly below the critical softening point of the resin so as to condition the polyethylene and the paper of the composite web. In addition, the crinkling cylinder is heated to maintain the film in the pliable condition, whereby crinkling (with the paper side of the web contacting the cylinder) can be effected without danger of puncturing or otherwise injuring the film. 9 figures. R.A.S.

EWING, HENRY, and BLACKMORE, JOHN S. Apparatus for distributing textile flock on a web. U. S. patent 2,681,036. Filed May 3, 1949. Issued June 15, 1954. 4 claims. Assigned to Celanese Corporation of America. [Cl. 118-51]

This is very similar to U. S. patent 2,681,446 (June 15, 1954); *cf.* abstract below. 1 figure. W.B.W.

EWING, HENRY, and BLACKMORE, JOHN S. Process and apparatus for making pile-surfaced material. U. S. patent 2,681,446. Filed Nov. 7, 1951. Issued June 15, 1954. 4 claims. Assigned to British Celanese Limited. [Cl. 117-17]

Fabric, paper, webs of regenerated cellulose, or the like are covered with a pile coating by the application of a floc fiber to the surface previously coated with adhesive, then passing the web through two high-voltage fields in succession to cause movement and orientation of the fibers and attachment to said adhesive surface. The adhesive used may be any of several types which are set by the application of heat to form a hardened flexible binder. A festoon drier or similar means is used to set the adhesive without causing damage to the pile surface. 3 figures. W.B.W.

HAEGELE, OTTO P. Paper article of head wear. Canadian patent 504,044. Filed Nov. 19, 1953. Issued June 29, 1954. 2 claims. Assigned to White Castle System, Inc.

This is identical with U. S. patent 2,669,725 (Feb. 23, 1954); *cf.* B.I.P.C. 24: 683. 12 figures. R.A.S.

MEYERS, GEORGE L. Laminated sheet material and method of making same. U. S. patent 2,680,700. Filed Sept. 26, 1950. Issued June 8, 1954. 13 claims. Assigned to The Eagle-Picher Company. [Cl. 154-139]

A method of making a laminated flexible sheet material comprising a thin surface layer of impregnated paper (I) bonded to a thin layer of a rubber backing is claimed; the product is decorative, resistant to cigarette burns and the like, and affords sound-deadening characteristics. (I) is formed from a hard smooth layer of melamine-formaldehyde resin impregnated paper, a decorative paper impregnated with melamine formaldehyde, and a double ply of paper impregnated with a phenol-formaldehyde resin; its total thickness amounts to 0.025-0.04 inch. (I) is bonded under heat and pressure to a base layer of flexible elastomer, 0.025-0.06 inch in thickness, compounded from natural or synthetic rubber, such as Neoprene. 7 figures. R.A.S.

NEWMAN, DOUGLAS A. Photosensitive planographic plate. Canadian patent 503,558. Filed Sept. 29, 1951. Issued June 8, 1954. 13 claims. Assigned to Columbia Ribbon and Carbon Manufacturing Company, Inc.

A planographic printing plate comprises a paper base, a coating of a carboxymethylcellulose salt, and a photosensitive layer made from dichromated albumin. This corresponds to U. S. patent 2,570,262 (Oct. 9, 1951); *cf.* B.I.P.C. 22: 226. W.B.W.

NEWMAN, DOUGLAS A. Planographic plate and method of making same. Canadian patent 503,559. Filed Sept. 29, 1951. Issued June 8, 1954. 5 claims. Assigned to Columbia Ribbon and Carbon Manufacturing Company, Inc.

A planographic printing plate is made by coating a paper base with a water-soluble carboxymethylcellulose compound which, after drying, is treated with an aqueous solution of copper and aluminum salts to coagulate the base coating. This plate is prepared for use by inscribing the surface with a water-repellent, ink-receptive image by typing or other means. W.B.W.

NEWMAN, DOUGLAS A. Transfer sheet. Canadian patent 503,426. Filed Nov. 8, 1949. Issued June 1, 1954. 13 claims. Assigned to Columbia Ribbon and Carbon Manufacturing Company, Inc.

A transfer sheet such as carbon paper is made nonsmudging by the addition of a wax layer containing flaky metallic particles over the transfer layer. This protective layer may be brushed or sprayed over the transfer layer, or a wax of lower melting point may be applied with a heated roller over the transfer layer. 5 figures. W.B.W.

NIELSEN, MORRIS L., and ARNOLD, RUSSELL W. Flameproofing composition of nitrogen-phosphorus compound in combination with organic compound having free hydroxy radicals. U. S. patent 2,680,077. Filed Dec. 30, 1949. Issued June 1, 1954. 6 claims. Assigned to Monsanto Chemical Company. [Cl. 106-15]

A fire-retarding coating composition which intumesces upon subjection to flame is composed of polyphosphorylamide and an alkyd resin. Such coatings may be applied to wood, steel, paper, fabric, leather, etc. W.B.W.

POCZATEK, FRANK G. Carbon paper for billing machines and the like. U. S. patent 2,680,629. Filed July 21, 1952. Issued June 8, 1954. 3 claims. [Cl. 282-19]

A long sheet of carbon paper for use in billing machines and similar office machines is zig-zag folded with front and back folds equally spaced and held uniformly staggered along a carbon holder of strong paper or the like by means of small adhesive pads at the front edge of the holder which secure the front folds of the carbon sheet firmly but releasably. 5 figures. R.A.S.

RUBIN, MILTON D. Method of manufacturing a conductive coated sheet and said sheet. U. S. patent 2,680,699. Filed April 21, 1952. Issued June 8, 1954. 12 claims. [Cl. 154-121]

A laminated sheet material having a top surface of highly conductive film

and inner layers of nonconductive material for use with "printed" circuits is produced by coating a porous thin sheet material (preferably kraft paper) with a very thin film of conductive metal (e.g., evaporated silver), plating one side with copper, brushing the nonplated side with a thermosetting plastic coating, and partially curing the plastic impregnation at 250°F. for a few minutes. This sheet is laminated to a base sheet, such as a phenolic resin base sheet, at pressures up to 250-300 p.s.i. and temperatures of 350-400°. 1 figure. R.A.S.

SMART, AUDREY C. Figure forming foldable sheet. U. S. patent 2,680,935. Filed Sept. 21, 1951. Issued June 15, 1954. 2 claims. [Cl. 46-124]

A method of folding a single sheet of paper is claimed, whereby a raised hollow pyramid portion is formed and a slit is provided to serve as a small bank. Sections of the paper are decorated with the figure of a bird or other design. 6 figures. R.A.S.

SÜS, OSKAR. Light-sensitive diazotype material. U. S. patent 2,680,074. Filed Feb. 7, 1951. Issued June 1, 1954. 7 claims. Assigned to Keuffel & Esser Co. [Cl. 95-6]

A diazotype coating which retains its contrast and does not fade during storage is made by adding the zinc chloride double salt of the diazo compound derived from 1-[N-ethyl-N-(β-diethylaminoethyl)]-amino-4-amino benzene to an aqueous solution containing citric acid, thiourea, the sodium salt of 2,3-dihydroxynaphthalene-6-sulfonic acid and the sodium salt of 1,3,6-naphthalene-trisulfonic acid. W.B.W.

PHYSICAL TESTING—TAPE TESTER

HERRLINGER, PAUL W. Tape testing device. U. S. patent 2,682,171. Filed Aug. 9, 1952. Issued June 29, 1954. 7 claims. Assigned to The Gummed Products Company. [Cl. 73-102]

A device for testing the bursting strength of stay tape under conditions simulating its use in a manufacturer's joint is claimed. Test strips of boxboard connected with the tape to be tested are clamped to a pair of pivotted plates disposed at 90° to each other. A piston and cylinder arrangement (with suitable measuring means attached) applies force to move the plates apart until the tape is ruptured. 8 figures. R.A.S.

PLASTICS—FIREPROOF

OLSON, HARRY S., and DANISON, ROBERT C. Transparent flame-resistant cellulose acetate butyrate. U. S. patent 2,680,691. Filed Dec. 16, 1948. Issued June 8, 1954. 6 claims. Assigned to Diamond Alkali Company. [Cl. 106-15]

A transparent, flame-resistant molding composition made from cellulose acetate butyrate and a chlorinated paraffin wax together with a stabilizer such as propylene oxide is suitable for either compression or injection molding. W.B.W.

RAYON—VISCOSE PROCESS

MITCHELL, REID L. Aging alkali cellulose. U. S. patent 2,682,536. Filed May 22, 1952. Issued June 29, 1954. 1 claim. Assigned to Rayonier Incorporated. [Cl. 260-233]

Controlled aging of viscose produced from highly purified cellulose is claimed for the addition of specified amounts of cobalt salts to the cellulose during processing. The aging time is carefully controlled by the quantity of cobalt added; the amounts vary between 0.2 and 2 p.p.m. based on the oven-dry pulp. 1 figure. W.B.W.

SHIPPING CONTAINERS

LARSON, MARVIN, STEDMAN, ALLAN L., and DANNEMILLER, FRANKLIN T. Tote box. U. S. patent 2,682,362. Filed Feb. 6, 1951. Issued June 29, 1954. 8 claims. Assigned to Convoy, Incorporated. [Cl. 229-23]

A strong corrugated fiberboard box with an open top, suitable for carrying and stacking, is claimed. Reinforcement for the end walls and provision of a stacking ledge to hold the box in nested relation with the one below is accomplished by the addition of an extra panel, folded at the bottom and stapled, stitched, or otherwise secured at each end. 8 figures. R.A.S.

SHIPPING CONTAINERS—FIBER DRUMS

BURLESON, MILTON N. Protective sleeve for top metal chime of fiber drums for liquids. Canadian patent 503,815. Filed Aug. 22, 1952. Issued June 22, 1954. 1 claim. Assigned to Continental Can Company, Inc.

Heavy-duty fiber drums which are used for shipping liquids and semiliquid products and which include a metal chime are provided with a sleeve of any suitable liquid-resisting material which is attached to the inner face of the drum and can be stretched over the chime to protect it from corrosion during filling or discharging the contents of the drum. 4 figures. R.A.S.

SHIPPING CONTAINERS—MULTIWALL BAGS

ALLEN, HENRY H. Bag closure. Canadian patent 503,802. Filed Dec. 22, 1950. Issued June 22, 1954. 15 claims. Assigned to Bemis Bro. Bag Company.

An improved closure for multi-ply bags of the gusseted type, which can be used for either or both the closed end of the bag during manufacture and closing the filled bag, is claimed. At the ends of the closure where the infolded gussets make a fourfold thickness, the outer two plies (in the case of a four-ply bag) are removed so that the folded top is of equal thickness throughout, of benefit when applying the folded closure cover and adhesive tape. 13 figures. R.A.S.

STARCH

CASEY, JAMES P. Method of preparing starch paste. Canadian patent 503,483. Filed Feb. 3, 1949. Issued June 1, 1954. 11 claims. Assigned to A. E. Staley Manufacturing Company.

The use of a mixture of starches with substantially different pasting or enzyme-converting temperatures, such as tapioca and corn starch or tapioca and rice starch, is claimed to eliminate objectionable thickening in a fluid starch paste. This is the same as U. S. patent 2,472,790 (June 14, 1949); *cf.* B.I.P.C. 19: 827. W.B.W.

HANSEN, DONALD W., GILL, LOWELL O., and WRIGHTSMAN, JOHN H. Modification of starch. Canadian patent 503,482. Filed

Nov. 4, 1948. Issued June 1, 1954. 11 claims. Assigned to A. E. Staley Manufacturing Company.

The moisture content of powdered starch is increased to 28% and the mixture passed between heated rolls rotated in opposite directions at different speeds. The product is then ground and dispersed in cold water. This corresponds to U. S. patent 2,464,081 (March 8, 1949); *cf.* B.I.P.C. 19: 606. 1 figure. W.B.W.

TALL OIL

BARTHEL, JUSTUS C., and HASTINGS, RANDALL. Tall oil rosin sizes stabilized with phenothiazine plus diarylamines. U. S. patent 2,680,694. Filed July 11, 1951. Issued June 8, 1954. 6 claims. Assigned to American Cyanamid Company. [Cl. 106-218]

Tall oil rosin may be effectively stabilized for use in sizing materials by the addition of from 0.5 to 2% of phenothiazine and about 0.2-2% of diarylamine, both based on the weight of rosin. W.B.W.

KALMAN, NICHOLAS L. Method for separating rosin acids from mixed materials. Canadian patent 504,016. Filed April 28, 1947. Issued June 29, 1954. 9 claims. Assigned to Ridbo Laboratories, Inc.

Rosin acids in tall oil are dissolved in acetone, then precipitated from the acetone solution with cyclohexylamine. This corresponds to U. S. patent 2,532,101 (Nov. 28, 1950); *cf.* B.I.P.C. 21: 297. W.B.W.

TEXTILE INDUSTRY AND FABRICS—FIREPROOFING

BURNELL, MAURICE R., and VAN LOO, WILLIAM J., JR. Aqueous dispersions and methods of preparing the same. Canadian patent 503,404. Filed April 19, 1949. Issued June 1, 1954. 12 claims. Assigned to American Cyanamid Company.

An aqueous dispersion useful for flameproofing fabrics, blankets, and nonwoven fabrics is made by dissolving monoguanidine phosphate and urea in a saturated solution at 140-160°F.; to this is added not less than 4% of ammonium hydroxide. To the above hot solution is added a metallic oxide (e.g., tin, antimony, bismuth) and a thermoplastic halogen-containing substance such as polyvinyl chloride. The material is agitated vigorously during cooling to improve the stability of the dispersion and avoid separation of the solids. W.B.W.

HAMALAINEN, CARL. Process for flameproofing textiles with polyphosphonitrilic ester. U. S. patent 2,681,295. Filed Dec. 5, 1952. Issued June 15, 1954. 3 claims. Assigned to United States of America as represented by the Secretary of Agriculture. [Cl. 117-137]

Polyphosphonitrilic chlorides in a solvent such as tetrachloroethane are reacted with 2,3-dibromopropyl alcohol at about 27°C., and the reaction mixture is used to impregnate textiles for flameproofing. Fabrics so treated are claimed to retain the flameproofing after repeated washings. W.B.W.

LOVELAND, ROBERT. Flame-proofing compounds. Canadian patent 503,686. Filed July 7, 1943. Issued June 15, 1954. 2 claims. Assigned to Johnson & Johnson.

A fireproof and weatherproof coating for woven or nonwoven sheets contains a mixture of polyvinyl acetate emulsion, tricresyl phosphate, and antimony trioxide. Pigments or a fungicide may be added if desired. This corresponds to U. S. patent 2,443,566 (June 15, 1948); *cf.* B.I.P.C. 18: 811.
W.B.W.

VANILLIN

LEWIS, HARRY F., and PEARL, IRWIN A. Vanillyl alcohol-formaldehyde resins. Canadian patent 503,720. Filed May 14, 1945. Issued June 15, 1954. 3 claims. Assigned to Sulphite Products Corporation.

A light-colored, thermosetting or thermoplastic resin is made by the condensation of vanillyl alcohol and formaldehyde under acid conditions in the presence of a catalyst. This is identical with U. S. patent 2,445,292 (July 13, 1948).
W.B.W.

WET STRENGTH

DEARING, WILLIAM C. Paper of improved wet strength. U. S. patent 2,680,682. Filed Jan. 26, 1950. Issued June 8, 1954. 4 claims. Assigned to Allied Chemical & Dye Corporation. [Cl. 92-3]

Paper made from kraft, sulfite, or groundwood pulps treated with a resin made by reacting urea or melamine, formaldehyde, and a substituted carboxylic acid (such as glycolic acid) is claimed to possess superior wet-strength properties. The resin may be added to the pulp at the beater or a similar location before the sheet is formed.
W.B.W.

DEARING, WILLIAM C. Paper treating resin. U. S. patent 2,680,734. Filed Jan. 26, 1950. Issued June 8, 1954. 2 claims. Assigned to Allied Chemical & Dye Corporation. [Cl. 260-70]

A paper-treating resin comprising the condensation product of urea and formaldehyde, an alkali metal salt of glycolic acid (e.g., sodium glycolate), and a glycol such as ethylene glycol is claimed to have improved stability and to impart greater wet strength to paper.
W.B.W.

WOOD—EXTRACTIVES

ERDTMAN, HOLGER G. H. Beta conidendrol and process for making the same. U. S. patent 2,680,748. Filed Sept. 26, 1950. Issued June 8, 1954. 22 claims. Assigned to Crown Zellerbach Corporation. [Cl. 260-343.3]

The process of reacting an amine such as pyridine with conidendrin at elevated temperature, dissolving the melt in hydrochloric acid, and washing with ether produced β-conidendrol in almost theoretical amounts. Conidendrin is a wood-extractive substance present in the spent sulfite liquors obtained during the pulping of western hemlock and other woods.
W.B.W.

WOOD—SACCHARIFICATION

WALLACE, LEWIS C. Method and apparatus for hydrolyzing cellulosic materials. U. S. patent 2,681,871. Filed Feb. 16, 1951. Issued June 22, 1954. 16 claims. Assigned 30% to Sam M. Nickey, Jr., 30% to W. Jeter Eason, 15% to Lawrence D. Kellogg, and 25% to United States Steel Corporation. [Cl. 127-1]

Sawdust, wood chips, or the like are introduced continuously by a compacting screw conveyor at the top of a reaction chamber, and dilute acid and steam are introduced at the bottom of it. The cellulosic materials are hydrolyzed to sugars which are drawn off at the top of the chamber with the spent hydrolyzing liquor, while the lignin residue settles at the bottom of the chamber from which it is expelled periodically by the opening of a spring-loaded valve. The hydrolyzed product is suitable for fermentation to ethanol or butanol or may be concentrated to molasses for stock feed. 7 figures.

W.B.W.

Book Review

WORMELL, ROBERT LOUIS. New fibres from proteins. New York, Academic Press, 1954. 208 p.

Although the title of the book would not indicate it to be of interest to the paper chemist, there may be value in this publication to those in the paper industry who are concerned with glue sizing or coating with casein or alpha protein. One of the main features of this book is the author's explanation of the corpuscular theory of protein structure which helps to explain the behavior of protein in cases where the polypeptide theory, the Pauling helix, and other concepts fail. The author appears to give a good balance between fundamental theory and physical behavior of proteins. Chapters on the general principles of fiber production, including dyeing and finishing, the contribution of protein fibers to the theory of tanning, and x-ray and infrared spectra of regenerated protein fibers are included. Methods for insolubilizing and reducing the swelling of proteins are discussed; procedures for the identification and estimation of fibers are described. Frans Vaurio

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At a reasonable cost the librarian will furnish complete reference lists on chemical and technical problems for member mills, and will procure translations, photostats, or abstracts of the articles listed. Upon request, member mills working on special problems will be kept in touch with new publications related to their work.

Reviews of new publications pertaining to the field of pulp and papermaking will be included from time to time.

The library is open daily with the exception of Sundays from 8 a.m.-5 p.m. and from 7 p.m.-9:30 p.m.; Saturday hours: 8 a.m. to noon and 1-5 p.m.